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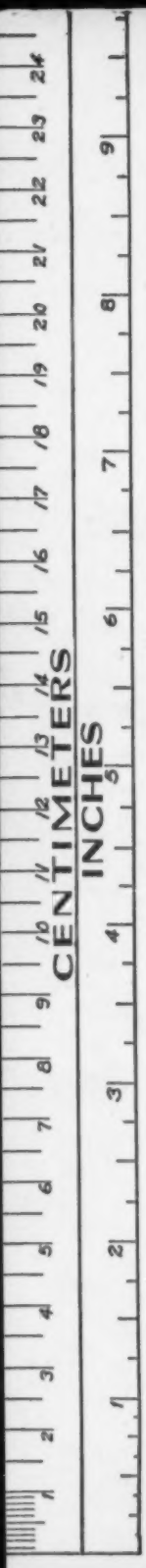

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CURVED SINGLE-PIECE FISHHOOKS OF SHELL AND BONE IN CALIFORNIA

ROBERT F. HEIZER

NOTWITHSTANDING the numerous published works which have specifically or incidentally treated with the curved fishhooks of California, there is available at present no single source which draws together the accessible information and cites the relevant bibliography. The present article seeks to remedy this situation and seems justified on the grounds of making available the California data to local workers and to those who are further interested in the near identity of some of the California types with those of the Chilean coast in South America, on the one hand, and with those of the Oceanian area, on the other. Within North America the distribution of single-piece curved bone fishhooks is spotty, and a theoretical problem of historical community of these various occurrences also awaits analysis.

Curved hooks of shell and/or bone occur in California in archaeological sites on the Santa Barbara Channel islands (San Miguel, Santa Rosa, Santa Cruz), on the islands farther south and more distant from the mainland shore (San Nicolas, San Clemente, San Miguel), and on the coast from Point Concepcion to Santa Ana. Bone hooks are known from the lower Sacramento Valley, and again from coastal shellmounds in Humboldt County in northwestern California. These three areas of curved fishhooks (south central coast, Central Valley, and northwestern coast) appear to represent isolated occurrences, similar objects being thus far unreported or absent in the intervening regions.

The materials for shell fishhooks consist primarily of abalone (*Haliotis*) and mussel (*Mytilus*). A third shell, *Norrisia*, was used rarely for hooks on Santa Cruz, San Nicolas, and San Clemente islands. All shells used for making hooks are iridescent, the luster, no doubt, acting as a lure for the fish. Bone was employed more rarely for making hooks and, because of its dull luster, we may be certain that bait or a lure was attached to these. Even stone was occasionally employed to make fishhooks, as attested by the reference to chipped and polished stone examples by Nelson (1936, p. 202) and Bryan (1931, p. 183). Shell and bone circular hooks vary in size from one-quarter inch to about three inches in diameter.

The method of manufacture of the curved shell fishhooks of the Santa Barbara region has been adequately treated by several authors (Robinson, 1942, pp. 60–1; Heye, 1921, pp. 135–6, Pl. XCIX; Rust, 1907, Pl. 31; Rau, 1884, Fig. 212; Irwin, 1946, p. 19; Schumacher, 1875; *idem*, 1877, Pl. 22; Yates 1900, Fig. 378; Gruvel, 1928, pp. 102–3, Fig. 87; Woodward, 1929, pp. 45–6, Pl. 22). A question may be raised here concerning statements by some of the authors quoted above who refer to the use of the pumpdrill or bowdrill for perforating the shell discs preparatory to shaping the hook. The pumpdrill or bowdrill *may* have been, anciently, a part of Chumash culture, but there is no clear evidence for its presence either in older or more recent times. The palm-rotated shaft drill illustrated by Nelson (1936, Fig. 3, *b*) would serve very well for drilling the shell ring fishhook blanks.

Several authors who have treated the south central California coast hooks have segregated them on the basis of shape, depending upon the form of the shank and tip. Table 29 presents a concordance of type designations employed by other authors.

Shell hooks of Types 1 and 2 (it is not possible to segregate the number of each from the printed descriptions) are of very general distribution on the mainland and island sites.

There may possibly be differences in their local site distributions, but until further analysis is made of museum specimens this cannot even be estimated. Type 1 hooks (Fig. 32, *a–g*), so far as available information goes, occur only of shell, the form in bone being thus far unreported. Type 2 hooks (Fig. 32, *h–m*) are made of both bone and shell. The bone examples are known from Santa Cruz Island (Site 138) and bone (Fig. 32, *c'*) and are known from Santa Cruz Island, according to Irwin (1946, p. 20; Fig. D, p. 21). Robinson (1942, p. 61) suggests that the barbed forms (Types 5, 6) are of post-contact origin and patterned after the European hook. One may ask why, if this were the case, the barb was not placed on the inner part of the tip and not the outer arc? What is particularly intriguing about the California barbed

TABLE 29. CONCORDANCE OF CURVED SHELL FISHHOOK TYPES

Typology Used in Present Study	*Material*		*Concordance of Types*			
	Shell	*Bone*	*Irwin*	*Gifford*	*Robinson*	*Orr*
1. Knobbed shank, simple point	×		Knobbed	AT2c	1	
2. Grooved or notched shank, simple point	×	×	Grooved	AT2c	1	
3. Simple pointed shank, simple point	×	×	Simple curve	AT2a	2	X2
4. Notched pointed shank, simple tip	×		Simple curve	AT2b	3	
5. Grooved shank, exterior barbed tip	×	×				X3
6. Notched pointed shank, exterior barbed tip		×	Barbed			

the Burton Mound at Santa Barbara. The distinctive feature is a flange or knob on the outer side of the shank end of the hook.

Type 3 hooks (Fig. 32, *n–s*) of shell are found in numerous coastal sites and on certain of the islands (Santa Cruz, San Nicolas, Santa Rosa, San Miguel). Type 3 bone hooks are reported from one site (No. 156) on Santa Cruz Island, and from Burton Mound, and Dos Pueblos (Olson's Site 78) on the mainland.

Type 4 hooks (Fig. 32, *t–y*) are made only of shell, and are recorded from several mainland sites, as well as from archaeological deposits on the islands of Santa Cruz, Santa Rosa, and San Miguel.

Type 5 hooks (barbed) are made of both bone and shell (Fig. 32, *z–b'*), examples made of the latter material being limited to three reported by Woodward (1930) from the Point Mugu midden. Bone hooks of this type are recorded by Orr from a mainland site (No. 7) not far from Carpinteria. Type 5 shell hooks also occur on Santa Cruz Island, according to Schumacher (1877, Pl. 22).

Type 6 hooks, also barbed, are made only of hooks is the fact that this type of barb also occurs in Polynesia (*cf.* Rau, 1884, Fig. 215, New Zealand).

In lieu of a distribution table showing number of hooks and their occurrence in sites, these data have been incorporated with the bibliographic references appended.

The curved hooks of the south central coast and islands were seen and described by Martinez in 1792, Anza and Fages in 1776. Fages implies their use by the northerly Chumash of San Luis Obispo, and the fact that such shell hooks have not been recovered from archaeological sites in the San Luis Obispo area may indicate their late importation, along with the plank canoe, during the mission period in the late eighteenth century. Successful testing of the curved hooks for securing fish has been carried out by Glidden (Heye, 1921, pp. 136–7) and Robinson (1946, pp. 63–4).

Curved hooks of shell and bone (there is no evidence that one material precedes the other in time) occur in upper stratigraphic levels which are Late, and represent the culture deposits laid down just anterior to the Spanish

EXPLANATION OF FIG. 32. *a–g*, Type 1 hooks of shell (after Bryan, Irwin, Gifford, Putnam, Robinson, Yates); *h–m*, Type 2 hooks of shell and bone (after Heye, Irwin, Gifford, Robinson); *n–s*, Type 3 hooks of shell and bone (after Gifford, Heye, Robinson); *t–y*, Type 4 hooks of shell (after Bryan, Harrington, Heye, Woodward, Yates); *z–b'*, Type 5 hooks of bone and shell (after Irwin, Putnam, Rau, Woodward); *c'*, Type 6 hook of bone (after Irwin); *d'–g'*, curved Choro shell hooks from northern Chile (after Bird).

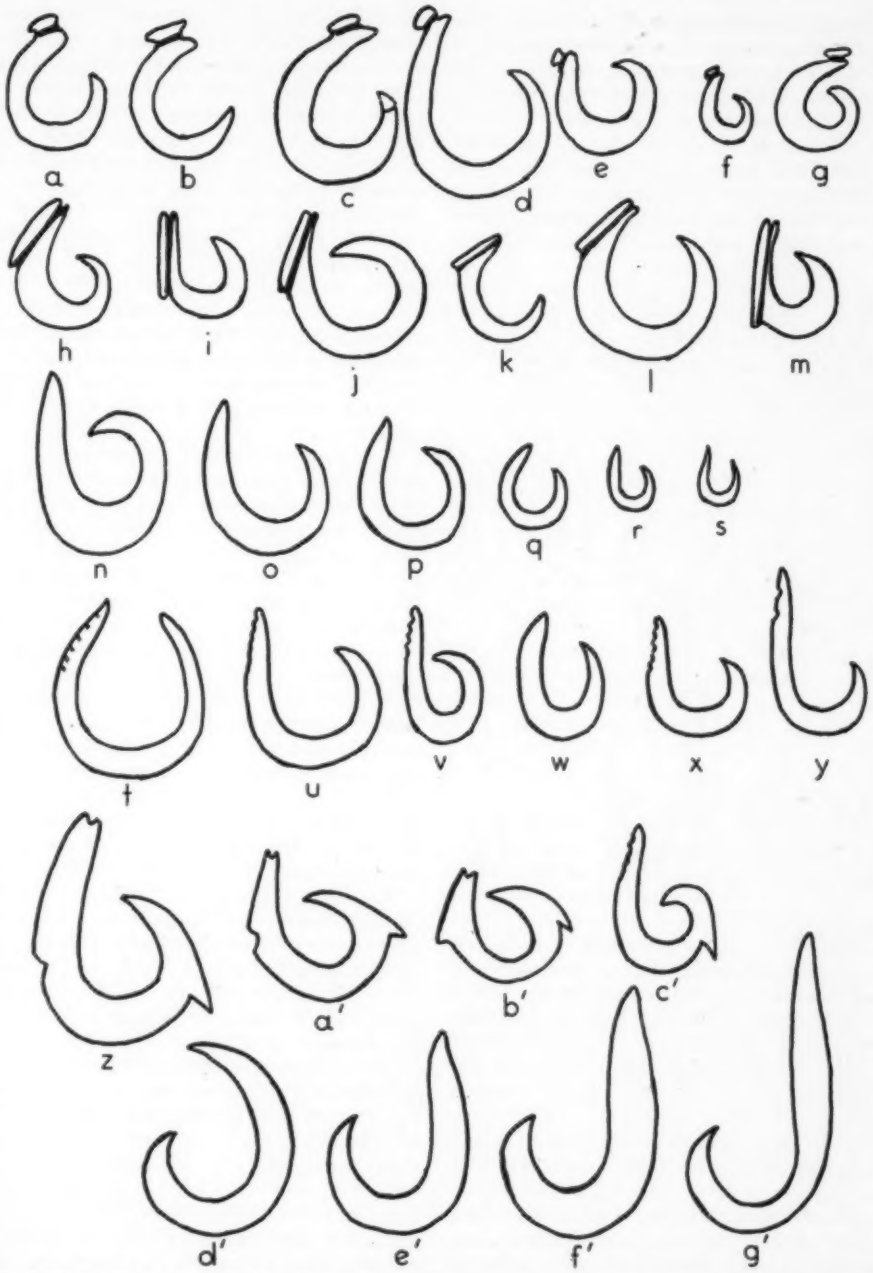

FIG. 32. Shell and bone fishhooks from the south central California coast and islands, and northern Chile. (See facing page for explanation.)

conquest and settlement in the latter half of the eighteenth century. The culture complex of which the curved hooks are a component is generally called "Canaliño" (after Rogers, 1929). The duration of the Canaliño culture, the last of a series of three which occupied the south central coast, is not known, but it reasonably has an antiquity of at least a thousand years. Data on the Late stratigraphic occurrence of curved fishhooks are contained in the papers by Rogers (1929), Olson (1930), Walker (1937), Orr (1943), and Woodward (1929). The occurrence in an Arizona site (NA-1785) of two *Haliotis* fishhook "blanks" dated in the first quarter of the twelfth century attests the existence of such hooks over eight hundred years ago (MacGregor, 1943, pp. 273, 283).

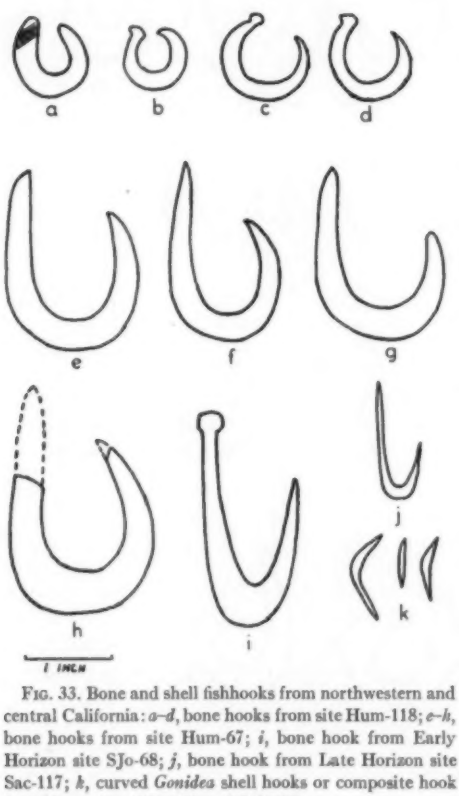

FIG. 33. Bone and shell fishhooks from northwestern and central California: *a–d*, bone hooks from site Hum-118; *e–h*, bone hooks from site Hum-67; *i*, bone hook from Early Horizon site SJo-68; *j*, bone hook from Late Horizon site Sac-117; *k*, curved *Gonides* shell hooks or composite hook barbs from sites CCo-138 and CCo-141.

Numerous authors have remarked on the close parallel afforded by the south central California coast shell fishhooks with those of Oceania. The hooks in the two areas are, indeed, so close that it is not difficult to suspect some Oceanic source for the California types. The excellent study by Beasley (1930) will furnish sufficient information on Oceanian hooks for a comparative study. Skinner's article on the fishhooks of Murihiki (1942, p. 261, Figs. 69, 70) classifies two Santa Barbara hooks as conforming to his Type 1, Variety A (subcircular, one-piece), and Gifford (1947, pp. 44, 110) compares and illustrates some Caroline Islands hooks with his Californian examples. This problem is a special one, and if a connection between the two areas is indicated by actual identity of form, the means of introduction may have been a live fish bearing a shell hook (cf. Heizer, 1944, p. 397).

The second Californian area which has produced a single-piece curved fishhook is a section of the lower Sacramento Valley on the border of the Sacramento-San Joaquin delta. Two hooks are known to me. One is from a Late Horizon site situated on the lower Cosumnes River named Woodard (Sac-117), the other is from the nearby, but much older, Early Horizon site named Blossom (SJo-68). The Sac-117 hook is of bone, and is shown in Figure 33, *j*. The SJo-68 hook (Fig. 33, *i*) is larger and heavier and also of bone. Both are thus far unique to each horizon in Central Valley. They resemble in no respect, except general form, the south central coast types, and because of the geographical gap between the two areas of occurrence, no historical connection may be supposed to exist.

Not many miles south of SJO-69 are Sites CCo-138 and CCo-141, from both of which have come a number of curious crescent-shaped hooks made of fresh-water mussel shell (*Gonidea angulata*). Gifford (1947, pp. 44, 110) suggests these may be barbs for composite fishhooks, and this must be admitted as possible. What is chiefly of interest as regards these shell specimens is their curvature—they occupy a typological position intermediate between the straight gorge hook and the curved, single-piece, C-shaped hooks which are the topic of discussion here. In view of the difficulty of classifying these lunate forms, they are simply presented here as modified-curve hooks of doubtful status. At any rate, if used alone they must have operated on the toggle or gorge principle, the line being tied around the center rather than at one end.

The third and last area of curved fishhook occurrence is on the northwestern coast at two sites in Humboldt County (Nos. Hum-67, Hum-118). Hum-67 is the large site tested by L. L. Loud in 1913 and excavated more completely fifteen years later by Dr. H. H. Stuart of Eureka. Hum-118 is the stratified shellmound at Patrick's Point State Park excavated in the summer of 1948 by the University of California. Somewhat farther north, on the southern Oregon coast, Berreman (1944, p. 25, Pl. 5, *B*, Figs. 20–22) has found several similar fragmentary hooks.

Hum-67 yielded large bone curved hooks which are fairly consistent in size. Six complete hooks (see Fig. 33, *e–h*) range between 2.0 and 2.75 inches long and 1.5 and 1.75 inches wide. The material is dense and hard, and probably comes from a large leg bone of the local Roosevelt elk. These hooks show some resemblance to the form I have called Type 3 for the south central coast area, but are more similar to the heavy bone example known only from Site SJo-68 in the lower Sacramento Valley. They remain, however, a local type without exact parallel elsewhere in California. Their characteristics are the simple, pointed shank; open throat; plain and only slightly incurved tip; and large size. I am indebted to Dr. Stuart for permission to study and publish these hooks in his collection.

From Site Hum-118 came four curved bone fishhooks (Fig. 33, *a–d*). These are all rather similar, and differ from those of Hum-67 in being consistently smaller and having more incurved tips. They approximate the subcircular form of the south central coast hooks. The Hum-118 hooks are made of some land animal (probably elk), bone, and sea-lion tooth. They range from 0.75 to 1.0 inch in diameter. They either bear a rudimentary knob, resembling in this respect some Type 2 hooks of the south central coast, or they have a plain shank which has been lightly roughened by incised crosshatched lines to assist in firmly attaching the line. All of the hooks from Hum-67 and Hum-118 are probably to be considered as relatively late, since they occur in the upper levels of the shell middens.

Each of the three areas from which single-piece curved fishhooks have come was one where fishing was an important subsistence pursuit. This holds particularly for the south central coast where the Chumash and Gabrieleno peoples with seagoing canoes (see Heizer, 1938, 1940) placed great dependence upon fish as an item of diet. That large amounts of fish were secured is amply attested in the early Spanish accounts, of which those of Font (Bolton, 1931, pp. 259, 262) and Crespi (Bolton, 1927, pp. 159, 165, 167) may be taken as typical. The abundance of curved hooks in south central coast sites is sufficient evidence in itself of the importance of fishing. In the lower Sacramento Valley region is found a network of river and slough channels which contain slow-moving streams teeming with fish. Fish bone is a noticeable component of the occupation refuse, and grooved sinkers, carbonized nets, and straight bone gorge hooks are of common occurrence in sites in this area. It is not known whether boats were employed here, but if some water conveyence were needed, the tule balsa or log raft would have served well. On the northwestern coast the people were, like the Chumash, familiar with the sea, and they employed their excellent dugout canoes for hunting otter, seal, and sea lion with harpoons. Presumably the curved bone hook was used for fishing either in the still waters of Humboldt Bay or in the freshwater lagoons between Rocky Point and the mouth of the Klamath River. The curved fishhook area of the northwestern coast probably extends as far north as the mouth of the Chetco River, if we include Berreman's finds as similar to the Hum-67 form. Favorable opportunity for still-water fishing obviously cannot account for the presence of the curved hooks, since San Diego Bay, Monterey Bay, and San Francisco Bay were similarly advantageous but did not know the curved fishhook.

The answers to the problem of three separate occurrences of a basically similar fishhook form will be difficult, and probably impossible, to achieve. Each area may have invented the C-shaped hook by itself, or one area may have been the source for either or both of the other occurrences. If Oceanian origin is to be argued the south central coast would appear to be the strongest contender on the basis of hooks made of shell in almost exactly the same form as some (not all) Oceanic hooks. The two lower Sacramento Valley hooks might possibly each represent inventions by a person familiar with a composite acute angled hook and the same possibility could be tentatively suggested for the two northwestern coast forms. Such speculations are intended merely to state the problem in terms of theoretical and alternative

solutions from the standpoint of the Californian occurrences.

Further complications present themselves when we note that the "Archaic" and later Mississippian horizons of the eastern United States also yield curved bone hooks of the open-throated, straight shanked form similar to those known in California from Sites SJo-68, Sac-117, and Hum-67. Some from Louisiana and New York are barbed, but not in the fashion of the south central California coast forms. Rau (1884, Figs. 200–201) illustrates Greenland Eskimo barbed bone fishhooks similar to those of New York and Louisiana. The possibility of some historical connection between the California and Eastern cultures has been suggested by Haag (1942) and Beardsley (1948). For curved single-piece fishhooks of the eastern United States see Claflin (1931, Pl. 41, *g*), Ferguson (1935, Pl. 12, *f–h*), Ford and Willey (1940, Fig. 54, p. 121), Griffin (1943, Pls. 15, 46, 51), Hadlock (1943, Fig. 34), Lewis and Kneberg (1947, p. 27), McKern (1945, Pl. 24), Mulloy (1942, Fig. 36), Putman (1887), Rau (1884, Figs. 183–193), Ritchie (1936*a*, Pl. 9), *Ibid.* (1936*b*, Pls. 9, 11), *Ibid.* (1944, Pls. 33, 61, 62, 101, 160), Setzler and Jennings (1941, Pl. 13), Strong (1935, Pls. 9, *a–d*, 24, *q*), Webb (1946, Fig. 45, *D*), Webb and De Jarnette (1942, Pls. 98, 221, 228), Webb and Haag (1939, Fig. 14.).

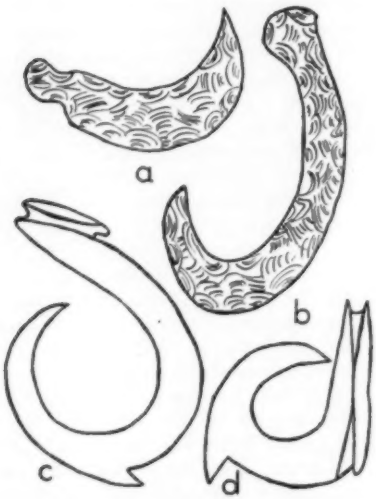

FIG. 34. Stone and bone hooks from California: *a*, chipped obsidian "hook," San Miguel Island (after Heye); *b*, chipped flint hook from Santa Barbara region (in Southwest Museum); *c*, *d*, Type 5 bone hooks, Santa Barbara region (in Southwest Museum).

The South American occurrence of curved hooks of shell, thorns, and chipped stone noted by Bird (1934, pp. 241, 262, 298, Figs. 18, 30, 33, 34, 43, 44) from the pre-pottery shell-mounds of northern Chile presents us with still another occurrence on the Pacific coast. Bird's hooks are closest to Types 3 and 4 of the south central California coast (e.g., Fig. 34, *b*). Should the South American hooks ultimately prove to be either of local invention or derived from some Oceanic source, the demonstration would have a bearing upon the solution of the problem of the origin of the Californian fishhooks. Were it not for the close resemblance of Oceanian forms to the shell fishhooks of northern Chile and the south central California coast the problem would not be so difficult—it is just this dilemma which so often faces the student of the origin and development of American cultures and constitutes grist of Gladwin's *Men Out of Asia* mill.

To summarize, deeply curved subcircular fishhooks of shell are known from the south central California coast and northern coast of Chile. Bone hooks of similar form occur in both these areas and also in a single site (Hum-118) on the northwestern coast of California. Heavier bone hooks of subrectangular outline are known in California from the lower Sacramento Valley (Sites SJo-68, Sac-117) and northwestern California coast (Site Hum-67) and sporadically throughout the eastern United States from Maine to Louisiana, and Montana to Georgia. The deeply curved bone and shell forms resemble closely certain hooks from Oceania. Several problems are presented for future analysis. These include the question of connection between the three areas of California which have yielded archaeological curved single-piece fishhooks, the problem of possible relationships between the hooks of California and those widely distributed in space and time in the eastern United States, and oft-mentioned but never attacked problem of possible connection between the subcircular shell fishhooks of the Pacific shores of California and northern Chile with those of the Oceanian area.

There is appended a bibliography of curved shell and bone fishhooks in California which may prove useful to other students. Also included are other titles referred to in the text.

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OLSON, R. L.

1930. "Chumash Prehistory." *University of California Publications in American Archaeology and Ethnology*, Vol. 28, No. 1. Berkeley. (Data on occurrence of shell fishhooks are in Tables 1–5. Fig. 2, *a*, *b* illustrates Types 2 and 3 hooks.)

ORR, P. C.

1943. "Archaeology of Mescalitan Island and Customs of the Canalino." *Occasional Papers, Santa Barbara Museum of Natural History*, No. 5. Santa Barbara. (On p. 32, Fig. 1, he attributes circular shell fishhooks to the Late Canalino period.)

1947. "Additional Bone Artifact Types in the Santa Barbara Museum of Natural History." Appendix in Gifford, 1947, pp. 115–32. (He notes and illustrates 18 Type 3 bone hooks and 125 Type 5 examples from two mainland sites and one site on Santa Cruz Island.)

PUTNAM, F. W.

1887. "The Way Bone Fish-Hooks Were Made in the Little Miami Valley." *Peabody Museum Report*, No. 20, pp. 581–6. Cambridge.

RAU, C.

1876. "The Archaeological Collection of the United States National Museum in Charge of the Smithsonian Institution." *Smithsonian Institution, Contributions to Knowledge*, Paper No. 287. Washington. (Fig. 242 illustrates a Type 5 barbed bone hook from Santa Cruz Island, California.)

1884. "Prehistoric Fishing in Europe and North America." *Smithsonian Institution, Contributions to Knowledge*, Vol. 25. Washington.

RITCHIE, W. A.

1936*a*. "A Prehistoric Fortified Village Site at Canandaigua, Ontario County, New York." *Research Records of the Rochester Museum of Arts and Sciences*, No. 3. Rochester. (Pl. 9 illustrates curved bone fishhooks.)

1936*b*. "New Evidence Relating to the Archaic Occupation of New York." *Researches and Transactions of the New York State Archaeological Association*, Vol. 8, No. 1. Rochester.

1944. *The Pre-Iroquoian Occupations of New York State*. Rochester. (Pls. 33, 61, 62, 101, 160 illustrate curved bone fishhooks of two types—one simple, the other with knobbed shank and inner barb.)

ROBINSON, E.

1942. "Shell Fishhooks of the California Coast." *Occasional Papers of the Bernice P. Bishop Museum*, Vol. 17, No. 4. Honolulu. (Description of types and manufacture of Santa Barbara mainland and island shell and bone curved fishhooks. He suggests, p. 61, that Types 5 and 6 barbed hooks date from post-Hispanic contact period.)

ROGERS, D. B.

1929. *Prehistoric Man of the Santa Barbara Coast*. Santa Barbara. (Pl. 47 illustrates Type 3 and 6 bone fishhooks. On p. 401 is a discussion of "coiled" type hooks. Rogers believes that they were "only intended to hold the bait and to be swallowed by the fish." Cf. this explanation with Robinson, 1942.)

RUST, H. N.

1907. "Archaeological Collections from San Miguel Island, California." *American Anthropologist*, n.s., Vol. 9, pp. 656–7. Washington. (Illustration of a number of shell fishhooks.)

SCHUMACHER, P.

1875. "Die Anfertigung der Angelhaken aus Muschelschalen bei den früheren Bewohnern der Inseln

im Santa Barbara Canal." *Archiv für Anthropologie*, Vol. 8, pp. 223–4. Braunschweig.

1877. "Researches in the Kjökkenmöddings and Graves of a Former Population of the Santa Barbara Islands and Adjacent Mainland." *United States Geographical and Geological Survey Bulletin*, Vol. 3, pp. 37–56. Washington. (Pl. 22 illustrates stages in the manufacture of a Type 5 shell fishhook on Santa Cruz Island.)

SETZLER, F. M., AND J. D. JENNINGS

1941. "Peachtree Mound and Village Site, Cherokee County, North Carolina." *Bulletin, Bureau of American Ethnology*, No. 131. Washington. (Pl. 13 illustrates a curved bone fishhook.)

SKINNER, H. D.

1942. "A Classification of the Fish-hooks of Murihiki." *Journal of the Polynesian Society*, Vol. 51, pp. 256–86. New Plymouth, New Zealand. (On Figs. 68, 70 and p. 261, 2 Santa Barbara region fishhooks are classed as Skinner's Type 1, Variety A [subcircular, one-piece hooks], and are compared to Polynesian examples.)

STRONG, W. D.

1935. "An Introduction to Nebraska Archeology." *Smithsonian Institution Miscellaneous Collections*, Vol. 93, No. 10. Washington. (Pl. 24, *left, a* is a curved bone fishhook from top level of Signal Butte site. Pl. 9, *a–d* are bone fishhooks from the Upper Republican culture.)

WALKER, E. F.

1943. "Indians of Southern California." *Masterkey*, Vol. 17, pp. 201–16. Los Angeles: Southwest Museum. (Fig. 4 is a photograph of four Type 1 shell fishhooks from the Santa Barbara region.)

WEBB, W. S.

1946. "Indian Knoll, Site Oh 2, Ohio County, Kentucky." *University of Kentucky Reports in Anthropology and Archaeology*, Vol. 4, No. 3, Pt. 1. Lexington. (Fig. 45 illustrates curved bone fishhooks.)

WEBB, W. S., AND W. G. HAAG

1939. "The Chiggerville Site." *University of Kentucky Reports in Anthropology*, Vol. 4, No. 1. Lexington. (Fig. 14 illustrates curved bone fishhooks.)

WEBB, W. S., AND D. L. DE JARNETTE

1942. "An Archaeological Survey of Pickwick Basin in the Adjacent Portions of the States of Alabama, Mississippi, and Tennessee." *Bulletin, Bureau of American Ethnology*, No. 129. Washington. (Pls. 98, 221, 288 illustrate curved bone fishhooks.)

WOODWARD, A.

1930. "Shell Fish Hooks of the Chumash." *Bulletin of the Southern California Academy of Sciences*, Vol. 28, pp. 41–5. Los Angeles. (He notes 134 shell fishhooks from Muwu site, of which 3 were of Type 5 and 131 of Type 2. No examples of Types 3, 4, and 6 were recovered. From Avila site came 2 shell hooks of Type 4.)

YATES, L. G.

1900. "Archaeology of California: Southern California." In W. K. Moorehead, *Prehistoric Implements*, Sec. VII, pp. 230–52. Cincinnati. (Fig. 378 illustrates the manufacture of shell fishhooks in the Santa Barbara area.)

Department of Anthropology
University of California
Berkeley, California
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THE PRE-IROQUOIAN POTTERY OF NEW YORK STATE

WILLIAM A. RITCHIE AND RICHARD S. MACNEISH

INTRODUCTION

THE establishment of ceramic type categories for the pre-Iroquoian horizons of New York state, exclusive of the Tidewater area,[1] was undertaken for a number of reasons. Primarily, it was believed that such an analysis, breaking down the existing ware divisions[2] into finer type inventories, would prove useful in obtaining a more minute chronological differentiation of the Owasco and Point Peninsula cultures than would be possible on any other basis, and in so doing, would aid in clarifying their possible relationships as well as their conceivable affinities with other major ceramic manifestations in the New York area.[3] It was also hoped that our survey might reveal significant areal subdivisions which eventually might be referred to historic tribal units. Finally, the achievement of a pottery typology for New York would elucidate problems of prehistoric culture diffusion and development over the Northeastern area and might, indeed, con-

[1] This area has been intensively studied by Carlyle S. Smith and will be reported on in his forthcoming doctoral dissertation (Smith, n.d.).

[2] Ritchie, n.d.

[3] These other manifestations are not treated *in extenso* for lack of a sufficient body of material.

tribute to broader interpretations of cultural dynamics and processes of acculturation involved in the complex interconnections of sequential archaeological components.

The nature of the prehistoric sites concerned in this study and the range of their artifactual materials determined the methodology employed, as well as the choice of pottery, as the basis for establishing a site chronology, since, generally speaking, pottery-bearing sites in New York are very productive of this most sensitive register of cultural change. Stratified midden deposits are by no means common in the area, and when present, usually exhibit the superimposition of discrete horizons, often widely separated in time.[4] It is thus very difficult to trace short time culture changes in terms of stratigraphy alone,[5] and, accordingly we have resorted to the process of pottery type seriation to disclose chronological progression.

In a study of this kind, in which the materials are arranged in an overlapping or interdigitating sequence (as dictated by the similarities compared), one must select an artifact trait or cultural feature which possesses the characteristics of considerable stylistic variability, sufficient abundance to provide for statistical validity, and occurrence at all sites embraced in the seriation study. The artifact best fulfilling these requirements in the New York state area, in the post-Archaic horizon, is pottery, and we have accordingly utilized the large collections of sherds and restored vessels obtained through the excavations of the Rochester Museum of Arts and Sciences on ten sites in western, central, and southern New York.

We have defined a type as a group of objects exhibiting interrelated similar features which have temporal and spatial significance.[6] We conceive of the typing of archaeological materials as an attempt to recapture the stylistic concepts in the minds of the original makers and to group these concepts in such a way as to show their trends in time and space. We believe that, at least to a certain degree, our types reflect aesthetic and utilitarian standards of value which operated as cultural compulsives on the minds of the artisans and, therefore, they possess some genuine measure of intrinsic validity.[7]

The significance of an established type is in turn obtained through the comparison by components, or levels in components, of the characteristic features or correlated group of features which differentiate the type. Conforming in general to the agreement reached at the Conference on Southeastern Pottery Typology held at Ann Arbor, Michigan in 1938,[8] we have observed in the delineation of our pottery types the traits of paste, surface finish, decorative design and technique, form, and vessel appendages, but we have actually utilized only the decorative design and technique, rim shape, and pot form, as the most diagnostic features of the pottery of this area. Later a correlation of these features with surface treatment and paste was attempted, but because the bulk of the material consisted of rim sherds without clue to surface treatment, the distribution of the latter feature is independently shown on the accompanying chart (Fig. 43).

Another difficulty lay in the considerable range of variation in rim shape and ornamentation. Such obstacles are inherent in the classification of any correlated series of variable features and our type descriptions attempt to meet the problem by expressing the range of differences for each ceramic feature, as well as stating the diagnostic elements of the type. We have also included statements of the known temporal and spatial ranges and speculations concerning the probable genetic and cultural affinities of the described types.

It will be necessary at this point briefly to describe the technique used to establish the ceramic taxonomy resulting from this study. As a first step, excavated sites of the same aspect were selected which afforded a large enough sherd sample for statistical treatment, i.e., a minimum of 250 decorated rims and an equal number of body sherds. The rim sherds from each site were then separately recorded by drawings on a large correlation chart, on which

[4] As Point Peninsula over Archaic, Owasco over Middle Point Peninsula, etc.

[5] The upper component of the Vinette site is the outstanding exception (Ritchie, 1944, pp. 160–6).

[6] Krieger, 1944, pp. 272, 277–8.

[7] Both Rouse (1939, p. 15) and Taylor (1948, p. 130) appear to express an essentially similar point of view.

[8] Report of the Conference on Southeastern Pottery Typology, held at the Ceramic Repository for the Eastern United States, Museum of Anthropology, University of Michigan, Ann Arbor, Michigan, May 16–17, 1938 (mimeographed); cf. Ford and Quimby, 1945, pp. 52–67.

the rim shapes were shown as the abscissa while the designs and techniques of decoration were depicted as the ordinate, the frequencies of each combination of the three variables being indicated as the tabular value (see Fig. 35).

Next, the individual charts from the sundry sites were combined into a second table that permitted the comparison of the correlated features among sites. This time the abscissa consisted of the correlated design, technique of decoration, and rim shape; the ordinate listed the components represented, or levels at a component; while the tabular value was the frequency, percentally expressed, of the total of the correlated features for each site (see Fig. 36). These percentile values could then be compared, site by site, for similarities or differences. It now became evident that certain combinations of rim form, design, and technique of ornamentation, were distinctive of certain sites. This would seem to justify their designation as types. (See column encircled by solid line.) Also

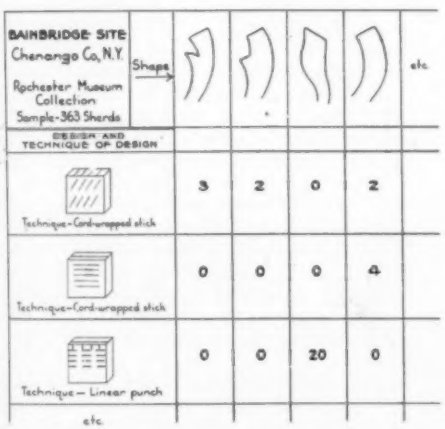

FIG. 35. Correlation of pottery designs, techniques, and shapes at the Bainbridge site, New York State.

it was shown that certain similar combinations had percentally the same relative value in the different sites, which fact caused them to be lumped into a single category. (See columns encircled by dotted line.) It will also be noticed that some combinations have similar trends in the site by site comparisons, while differing radically in compared features one from the other. On the basis of such discrepancies these are also considered discrete types. (See columns enclosed by hatchured lines.)

Now separate description sheets were made for each ceramic type, showing the full range of the elements compared, and indicating site

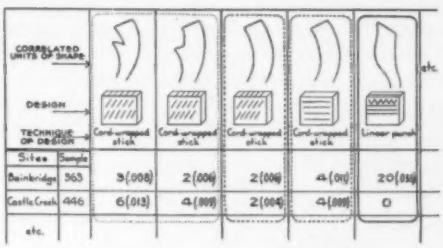

FIG. 36. Comparison of ceramic correlations in New York sites.

distributions and frequencies. A random sample series of the actual potsherds described in each type sheet was then examined in terms of paste composition, surface finish, and the presence or absence of secondary features, such as lugs, castellations, etc. If any of these secondary characteristics seemed to show comparative significance a further subdivision of type was made. The final step in the analysis consisted in the creation of a nomenclature according to accepted canons, utilizing provenience and major descriptive features.

The types having been established, the actual process of seriation could now begin, in which the type percentages were compared site by site. It was assumed that closely comparable values indicated a corresponding proximity in time and space. Previous stratigraphic evidence having proved the priority of the Point Peninsula culture, it seemed a valid deduction to orient those Point Peninsula sites having the closest similarity to Owasco at the top of the Point Peninsula series, and conversely, those Owasco sites showing the closest ceramic affinities with Point Peninsula at the base of the Owasco lineage. This further assumption seems to be well supported by the evidence adduced. The obvious inconsistencies which appeared in a number of instances may be due in large measure to the still fragmentary nature of our data and will be specifically discussed in the interpretations which follow the ensuing description of the ceramic types.

POINT PENINSULA SERIES

The Point Peninsula series is characterized by rectangular dentate-stamp or corded-stick decorations, body decoration, relatively small (approximately one or two gallons, apparently) elongate-bodied vessels, with conoidal base, nearly pointed or rounded lips on slightly everted (often sharply at the top) rims, and the coiled process of manufacture. The interior surface is commonly channeled and the exterior, smooth in the earlier stages, often corded in the later ones.

VINETTE 1 (Fig. 37, *a*, *b*)

Paste:

Tempering: The tempering consists of large pieces of quartz or pulverized crystalline rock (over 3 mm. in diameter) in rather large amounts.

Texture: The sherds are coarse and in cross section are seen to be very porous and often contorted. Frequently actual coil breaks may be observed.

Color: Exteriors range from buff through gray to black while interiors range from charcoal gray to black. In cross section the sherds show dark interiors with rather sharp color gradation toward both surfaces.

Hardness: *Ca.* 2.0.

Surface finish: The entire exterior has been malleated with a cord-wrapped paddle and the cord-markings run in various directions, although they tend to be vertical. Interior surfaces are also completely cord-marked, the impressions always running in a horizontal direction.

Decoration: None.

Form:

Rims: Straight and slightly outsloping with a gradua thinning of the sherd toward the lip.

Lips: Rounded and sometimes almost pointed.

Necks: Straight.

Bodies: Elongated.

Bases: Conoidal.

Diagnostic features of the type: Complete interior and exterior cord-marking.

Temporal range: This type first appears in the Middlesex Focus, where it is the exclusive form. It is the dominant type of the New York Hopewellian. It characterizes the Early Point Peninsula and survives into Middle Point Peninsula times.

Geographical range: Very similar forms are to be found along the Atlantic Coast from New England to Maryland. South of New York they appear over much of eastern Pennsylvania. On the west a few sherds of the type have been found near London, Ont., while central New York State appears to represent a northern boundary for the type.

Probable relationships of the type: The type is similar to Fayette Thick in the Adena of Ohio and Kentucky and Type C of Red Ochre in Illinois. Certain Early Woodland sherds from Minnesota and Wisconsin also appear to be similar. In the majority of regions where the type is found (except the Susquehanna River Valley and Virginia, where steatite-tempered sherds may be earlier) it occurs in the lowest ceramic horizons. As yet its place of origin is unknown, but we believe that the type could not have been derived from the south where cord-marking is rare or absent in the earliest culture platforms. We also feel that investigation north of the Great Lakes through Canada and Alaska to Siberia might shed some significant light on the problem of origin of this type, as well as on the origin of Vinette 2 ware, and probably of Woodland pottery as a whole.

VINETTE DENTATE (Fig. 37, *c–e*)

Paste:

Temper: Quartz or a similar aplastic of small to medium size (from *ca.* 1 mm. to 3 mm. in diameter), in large amounts.

Texture: Flaky and somewhat crumbly. Cross sections reveal a laminated structure.

Color: Interior and exterior surfaces range from salmon or peach to charcoal gray and contrast markedly with the black interior.

Hardness: *Ca.* 2.5.

Surface finish: The surface is smooth and sometimes shows wiping impressions. The inner surface is often channeled.

Decoration:

Designs: The commonest design, as seen on large rim sherds, consists of oblique or vertical, short linear dentations on the rim, above horizontal encircling lines of similar impressions on the neck. However, herringbones, horizontal plats, and horizontal bands occur. Oblique dentations mark the rim interior.

Techniques: The dentation appears to have been made with an object having teeth about 1/16 to 3/16 inch wide, leaving impressions usually rectangular in shape. It has been suggested that the notched-ended bone tubes and even small square-barbed harpoons from Kipp's Island were the kinds of implements used in making these impressions.

Form:

Rims: The rim is often contracted at a point well below the lip. The lip-bearing portion is usually markedly outflaring. Rims at Jack's Reef have a tendency to be slightly less contracting.

Lips: Earlier forms are usually rounded or almost pointed, but in the later Jack's Reef series they are somewhat flatter.

Necks: Slightly contracted.

Bodies: Elongated.

Bases: Conoidal.

Diagnostic features of the type: Simple linear arrangements of rectangular dentate impressions on rim, neck, and probably body of conoidal vessel with outsloping rim.

Temporal range: This type first appeared in the earliest Point Peninsula level and reached its greatest popularity in the latter part of Middle Point Peninsula times. It was apparently waning by the period of Jack's Reef occupation.

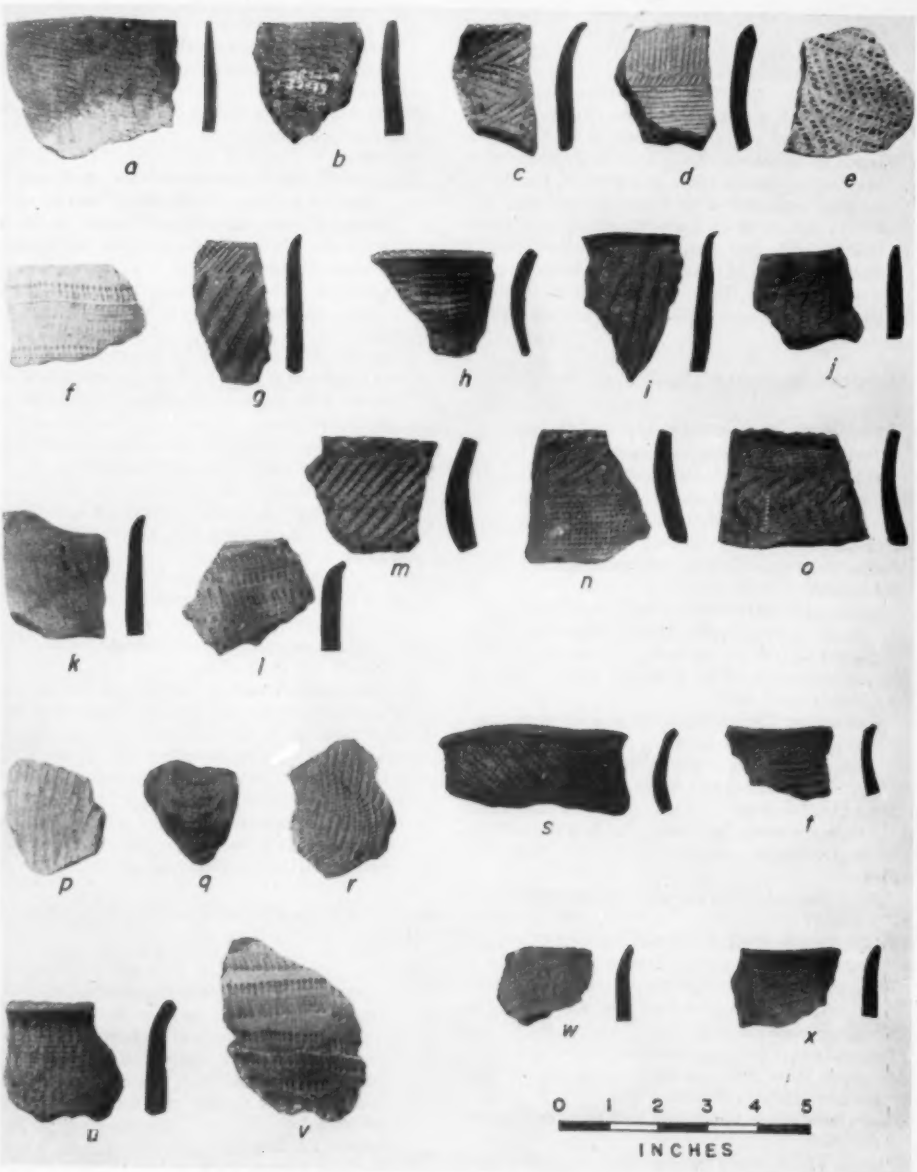

FIG. 37. Pottery types of the Point Peninsula series, New York State: *a*, *b*, Vinette 1; *c–e* Vinette Dentate; *f*, *g*, Vinette Complex Dentate; *h–j*, *m–o*, Point Peninsula Corded; *k*, *l*, *p–r*, *u*, *v*, Point Peninsula Rocker-Stamped; *s–t*, St. Lawrence Pseudo Scallop Shell; *w*, *x*, Point Peninsula Plain.

Geographical range: Upper New York and eastern Ontario.

Probable relationships of the type: A type similar (or possibly identical) occurs along the Atlantic littoral from Nova Scotia to New York City, and westward through New England, northern New York, Ontario, northern Michigan, and northern Wisconsin to the Mille Lacs region of Minnesota. Again there is similarity with Hopewellian ceramic forms farther south, but this is less than in the case of the Rocker-Stamped type. We believe this to be an Early Woodland type whose ultimate origin and relationships extend northwestward from the Great Lakes region. The type may have given rise to the Point Peninsula Corded type and thence to the Carpenter Brook Cord-on-Cord type of the Owasco.

VINETTE COMPLEX DENTATE (Fig. 37, *f*, *g*)

Paste:

Temper: Small to medium-sized pieces of quartz.

Texture: Coarse, porous, and laminated.

Color: Wide range of variation of interior and exterior surface between red-orange and charcoal gray with paste interiors markedly darker.

Hardness: *Ca.* 2.2.

Surface finish: Smooth. Interior often channeled.

Decoration:

Designs: There are either horizontal or vertical parallel bands of complicated dentate decoration. These bands are from one-quarter to one inch wide and are usually separated by a smooth zone of approximately equal width.

Techniques: The technique of making these complicated dentated bands is difficult to envisage. Superficially the bands resemble impressions of ribbons of closely knit fabrics. However, plasticine impressions of the decorations lead us to believe that these are overlapping and juxtaposed dentate and rocker-dentate stampings.

Form:

Rims: Everted at the top and contracted below this area.

Lips: Usually rounded or almost pointed.

Necks, bodies, and bases: Unknown.

Diagnostic features of the type: Zoned areas of complicated dentate impressions on everted rims with rounded or nearly pointed lips.

Temporal range: The type appears as a minority ware all through Point Peninsula times and is slightly more frequent in Middle Woodland sites.

Geographical range: Upper New York State and eastern Ontario.

Probable relationships of the type: This type appears to be a regional specialization. The inventors may very well have derived their ideas from the contemporaneous dentate and rocker-stamped types.

POINT PENINSULA CORDED (Fig. 37, *h–j*, *m–o*)

Paste:

Temper: Grit of medium size.

Texture: Flaky and crumbly.

Color: Exterior and interior surfaces range from reddish orange to charcoal gray with the paste interiors noticeably darker.

Hardness: *Ca.* 2.3.

Surface finish: Either smooth or cord-marked. Interior frequently channeled.

Decoration:

Designs: The commonest design is an encircling series of parallel, horizontal impressions. These are sometimes combined with oblique elements on the exterior rim. Herringbones, plats, and plain oblique lines occur, but very rarely.

Techniques: The edge of a cord-wrapped paddle or a corded-stick was impressed on the yielding clay.

Form:

Rims: Usually outflaring at the top, and all but a few of the sherds of this type from the Jack's Reef site reveal some degree of contraction of the rim area below the lip.

Lips: Usually rounded or almost pointed. Jack's Reef sherds, however, have a few flattened lips.

Necks, bodies, and bases: Unknown.

Diagnostic features of the type: Horizontal and/or oblique cord-impressed outflaring rims, usually with rounded or nearly pointed lips.

Temporal range: This type makes its appearance in early Point Peninsula times and gradually increases in frequency throughout the period.

Geographical range: Eastern Canada and upper New York.

Probable relationships of the type: It may have evolved from the combined concepts of the designs of dentate impression and the use of the corded-paddle. The type has wide relationships throughout much of the Northeast and the northern Great Lakes region (including northern Minnesota). The concepts involved in this type certainly contributed to the genesis of all succeeding Owasco types and particularly to the Carpenter Brook Cord-on-Cord type.

POINT PENINSULA ROCKER-STAMPED (Figs. 37, *k*, *l*, *p–r*, *u*, *v*; 41, *b*)

Paste:

Temper: Large grit particles (quartz, etc., *ca.* 2 to 4 mm. in diameter), in large amounts.

Texture: The paste is crumbly and porous.

Color: Interior and exterior surfaces range between yellowish orange and black. However, both surfaces usually contrast sharply with the interiors, which are black.

Hardness: *Ca.* 2.3.

Surface finish: Smooth. Channeled interior very common.

Decoration:

Designs: Rocker stamp impressions usually occur in horizontal overlapping bands with the rocker marks running vertically. Rarely the rockers run horizontally (less than 3 per cent). Oblique dentate lines occur on the inner rim and lip.

Techniques: The rocker marks were evidently made

with curved objects, possibly a toothed disk or roulette, or the notched edge of a paddle or stick, or notched-ended tubes (like those found at Kipp Island). Occasionally the implement was unserrated and left therefore a plain rocker mark. Rocker stampings made with a cord-wrapped stick occur very rarely.

Form:

Rims: Usually sharply everted at the top but contracted below this point. There is a general tendency for the rim to be slightly less contracted in the sherds of this type from Jack's Reef, but the percental change is too slight to justify subdivision.

Lips: Usually rounded or nearly pointed. Those from later sites (e.g., Jack's Reef) are usually flatter.

Necks: Only slightly constricted and sometimes almost straight.

Bodies: Elongated or semi-globular.

Bases: Subconoidal to almost pointed.

Diagnostic features of the type: Dentate or plain rocker-stamped ornamentation in all-over pattern, on conoidal pots with everted rims and usually rounded or nearly pointed lips.

Temporal range: This type begins in Early Point Peninsula times and reaches its maximum incidence near the end of the Point Peninsula period.

Geographical range: Upper New York State, eastern Ontario, and Maine.

Probable relationships of the type: This type seems to be present in certain shell-heaps of coastal Maine. Very similar forms occur throughout littoral New England north to Nova Scotia. Illustrated materials from eastern Michigan, Wisconsin, and Minnesota suggest its presence there. We believe this to be an early (probably pre-Hopewellian) northern type which was diffused eastward via the St. Lawrence Valley, where it is very common.

POINT PENINSULA PLAIN (Fig. 37, *w*, *x*)

Paste:

Temper: Grit, usually of small size (less than 2 mm. in diameter).

Texture: The sherds have a sandy feel due to the particles of tempering matter which may be seen on their surfaces.

Color: Exterior and interior surfaces show considerable range in color from terra-cotta to charcoal gray. In cross section the surfaces contrast sharply with the darker interior.

Hardness: *Ca.* 2.5.

Surface finish: Smooth.

Decoration: Incised lines cross the lip, and in a few cases there are oblique dentate-stamp impressions on the interior rim.

Form:

Lips: Rounded.

Rims: Outflaring near the lip and contracting somewhat below.

Necks: Very slightly constricted.

Bodies and bases: Unknown.

Diagnostic features of the type: Smooth surfaced vessels with decoration consisting of incised lines on the lip.

Temporal range: Middle Point Peninsula times.

Geographical range: Central New York and eastern Ontario.

Probable relationships of the type: Difficult to determine due to the general nature of its features.

ST. LAWRENCE PSEUDO SCALLOP SHELL (Fig. 37, *s*, *t*)

Paste:

Temper: Quartz or a similar aplastic of small to medium size and in large amounts.

Texture: flaky and laminated in structure.

Color: Varying shades of brown to gray. Paste interior dark.

Hardness: *Ca.* 2.5.

Surface finish: Smooth. Inner surface often channeled.

Decoration:

Designs: Designs mainly consist of short oblique or horizontal impressions on the rim and neck. Rarely the two designs are combined with oblique lines occurring on the outer rim and horizontal lines on the neck. Rim interiors usually manifest oblique lines.

Techniques: The designs were evidently effected by the application to the wet clay of the serpentine edge of some unknown object, possibly a natural stamp, strongly simulating the scallop shell impressions seen on some Maine coastal sherds.

Form:

Rims: Somewhat contracted, outflaring, often quite sharply, at the lip.

Lips: Rounded or almost pointed.

Necks: Straight to slightly constricted.

Bodies and bases: Unknown.

Diagnostic features of the type: Compact, sinuous, impressed lines on a thinned, outflaring rimmed pot.

Temporal range: Middle Point Peninsula times.

Geographical range: Upper New York, eastern Ontario, St. Lawrence River Valley, Nova Scotia, and coastal Maine.

Probable relationships of the type: This evidently is a northern New York, eastern Canadian, and northern New England type which may tie the various areas together. Prototypes are unknown.

WICKHAM INCISED (Fig. 38, *a*, *b*)

Paste:

Temper: Grit (mainly quartz) of medium to large size (*ca.* 2 to 4 mm. in diameter).

Texture: The surface of the sherds is coarse and somewhat sandy. Cross sections show the interiors to be contorted.

Color: The surfaces range in color from salmon red to charcoal gray, with more than half in the latter category. Surfaces are quite distinct from the dark interior area between.

Hardness: *Ca.* 2.5.

Surface finish: Sherd exteriors are smooth. More than half have channeled interiors.

Decoration:

Designs: All but three of these sherds show a series of parallel incised lines which are sometimes crossed by a second series of parallel lines at an acute angle. Three sherds show a herringbone design. The work seems careless and random.

Techniques: Incising, perhaps with a comb-like object.

Form:

Lips: Rounded.

Rims: One rim appears to have borne a wide collar while the remainder are either slightly insloping or slightly outsloping.

Necks: Poorly defined and almost non-existent.

Bodies and bases: Unknown.

Diagnostic features of the type: The only design is a series of rudely incised parallel lines on the rim, neck, and body.

Temporal range: Middle Point Peninsula.

Geographical range: Wickham and Vinette sites in central New York.

Probable relationships of the type: Unknown.

WICKHAM CORDED (Fig. 38, *c*, *d*)

Paste:

Temper: Grit of medium size (*ca.* 2 mm. in diameter).

Texture: The sherds have a sandy feel and cross sections show the paste to be contorted and porous.

Color: Sherd surfaces vary from cinnamon brown to pearly gray. Interiors are much darker.

Hardness: *Ca.* 2.5.

Surface finish: In the main, smooth on both surfaces. About one-fourth have a channeled interior surface.

Decoration:

Designs: A series of parallel lines cross to form rhomboids on five of the sherds. On the remaining two occur parallel vertical lines on the rim and horizontal lines on the neck. The interior rims of all sherds have oblique cord impressions.

Techniques: The decorations were made by impressing a fine cord on the plastic paste.

Form:

Lips: Rounded or almost pointed.

Rims: Contracting above the neck and sharply everted at the lip.

Necks: Straight or slightly constricted.

Bodies and bases: Unknown.

Diagnostic features of the type: Single cord-impressed lines on a vessel with an outsloping rim and rounded or pointed lip.

Temporal range: Middle Point Peninsula.

Geographical range: Central New York.

Probable relationships of the type: This type has a limited history in New York and exerted small effect on the general ceramic trends.

WICKHAM PUNCTATE (Fig. 38, *e*, *f*, *i*, *j*, *l*, *m*)

Paste:

Temper: Quartz and other crystalline grit of medium size (*ca.* 2 mm. in diameter).

Texture: There is a considerable range of variation in the texture of this pottery. Most of it is porous but it varies from a very slight laminated structure to a markedly contorted one.

Color: Color ranges from pearly gray through buff and brown to charcoal gray with a very few orange sherds. Interior surfaces also show the same range in color as the exteriors. In cross section there is an abrupt change in color near the surfaces with the centers being darker. This has been interpreted by us as meaning that firing reached the interior and exterior surfaces equally. Since rim sherds are inclined to be more oxidized than body fragments it would appear that the pots were fired upside down but with the mouth raised above the ground.

Hardness: *Ca.* 2.5.

Surface finish: Interior surfaces may or may not have channeling.

Decoration:

Designs: The most noticeable design is a row of punctations on the exterior rim. These usually raise slight nodes on the interior surface. Decoration under the punctations and on the rest of the vessel shows considerable variation and may allow for further differentiation of this type when sites with comparable materials have been excavated.[9] Seven sherds have smooth surfaces under the punctations while four are cord-marked all over. Punctations appear below collars with vertical dentations on seven specimens. Five have punctations associated with oblique dentations, two with horizontal dentations, two with incising, while two occur with a punched herringbone design.

Techniques: The punctations were made with a solid, round, slightly pointed object and were impressed on the slightly damp exteriors of the pots after the modeling and preliminary decoration had been finished.

Form: Shows considerable variation.

Rims: Usually slightly outflaring, although six have collars.

Lips: Rounded but not pointed.

Necks, bodies, and bases: Unknown.

Diagnostic features of the type: Exteriors of the rims carry punctations.

Temporal range: Middle Point Peninsula times.

Geographical range: Wickham and Vinette sites in central New York.

Probable relationships of the type: Unknown.

KIPP ISLAND CRISSCROSS (Fig. 38, *g*, *h*, *k*)

Paste:

Temper: Grit of medium size.

Texture: Sandy with specks of mica visible in some sherds. The interior sometimes shows laminations.

Color: Orange to charcoal gray on both exterior and interior surfaces. A cross section of the sherds shows that the surfaces are markedly lighter in color than

[9] Ritchie has differentiated four subtypes in his report on the Wickham site (1946, pp. 13–4).

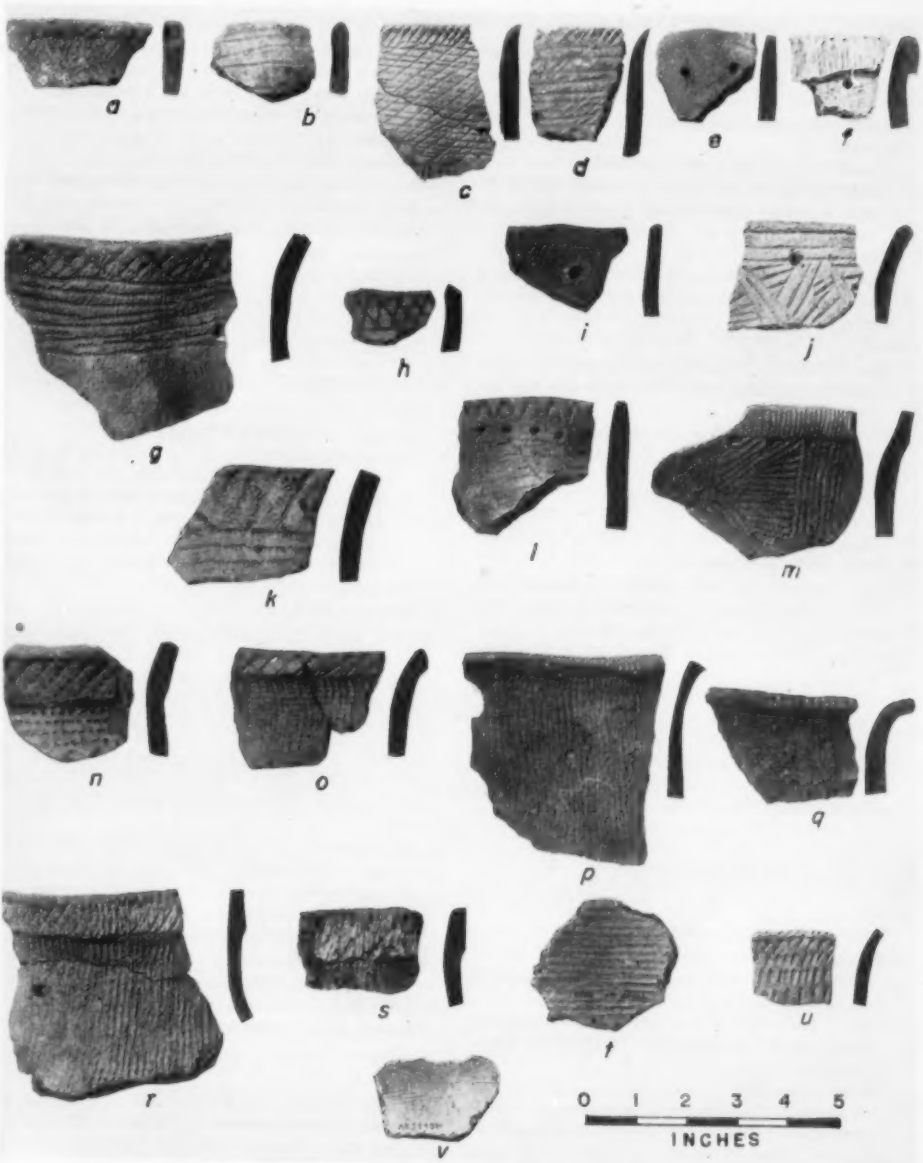

FIG. 38. Pottery types of the Point Peninsula series, New York State: *a*, *b*, Wickham Incised; *c*, *d*, Wickham Corded; *e*, *f*, *i*, *j*, *l*, *m*, Wickham Punctate; *g*, *h*, *k*, Kipp Island Crisscross; *n*, *o*, Jack's Reef Dentate Collar; *p*, *q*, Jack's Reef Corded; *r*, *s*, Jack's Reef Corded Collar; *u*, Jack's Reef Corded Punctate; *t*, *v*, channeled interior.

the interior paste of the vessel wall, giving the appearance of a slip.

Hardness: *Ca.* 2.5.

Surface finish: The surface of body and rim sherds indicates that they were originally cord-marked, although on 25 per cent of the sherds smoothing has largely obliterated the cord impressions.

Decoration:

Designs: Rim exteriors are embellished with a crisscross design impressed above horizontal lines on the neck. Lips bear either crossing or encircling impressions. Rim interiors are obliquely corded or crisscrossed.

Techniques: Some of the designs were made with a rectangular dentate stamp, others with a cord-wrapped stick.

Form:

Lips: Usually flattened, although the decorations on their surfaces have tended to roughen this once flat surface.

Rims: Slightly outflaring and contracted somewhat below the lip. A weak collar is suggested by the rim decoration.

Necks: Slightly constricted, usually reaching their maximum in this respect at the base of the crisscross design.

Bodies and bases: Unknown.

Diagnostic features of the type: A crisscross design upon a slightly outflaring rimmed vessel with a flat lip.

Temporal range: Late Point Peninsula times.

Geographical range: Central New York and eastern Canada.

Probable relationships of the type: This type may well have been derived from the Point Peninsula Corded and Vinette Dentate variants that have oblique lines on the rim above horizontal lines on the neck. It also may be a rude imitation of more westerly crisscrossed Hopewell Collar and Channel types. It is always a minority type and does not carry over into Owasco times.

JACK'S REEF DENTATE COLLAR (Fig. 38, *n*, *o*)

Paste:

Temper: Grit of medium size.

Texture: The sherds are flaky and exhibit surface cracking. Cross sections reveal a laminated and porous interior.

Color: Usually dark with a minority of bright tan or orange pieces. Interior surfaces are invariably much darker.

Hardness: *Ca.* 2.25.

Surface finish: The surfaces are either smooth, smoothed-over cord, or corded. The rims are smooth or smoothed-over cord. About 75 per cent of the sherds have interior channeling.

Decoration:

Design: Oblique dentate stamp decorations occur on the collar, while the neck may carry rocker-stamped, oblique dentate, or cord-marked embellishment.

Techniques: Collar decoration was done with a rectangular dentate stamp.

Form:

Rim and lip: There appear to be two kinds of collared forms. These may eventually be differentiated into two types when more data are available. One form has a flattened lip and a wide flat collar made by luting a clay band along a contracting rim. The second form has a pointed lip and a round bulging collar.

Necks, bodies, and bases: Unknown.

Diagnostic features of the type: Oblique dentate lines upon short collars.

Temporal range: Late Point Peninsula.

Geographical range: Central New York and eastern Ontario.

Probable relationships of the type: This type appears to be closely related to the Jack's Reef Corded Collar type.

JACK'S REEF CORDED (Fig. 38, *p*, *q*)

Paste:

Temper: Grit having a wide range of size.

Texture: Sherds are flaky and cross sections show the interiors to be laminated and often contorted.

Color: Exterior surfaces are usually charcoal gray with a few approaching yellowish gray. Interior surfaces on 80 per cent of the sherds are darker than the exteriors but of the same color as the intervening paste area.

Hardness: *Ca.* 2.5.

Surface finish: The sherd exteriors are marked with vertical cord impressions. Interiors are smooth, only one sherd showing channeling. A few (10 per cent) of the sherds bear horizontal ridge markings made by the edge of the cord-wrapped dowel or paddle.

Decoration: Decoration is negligible, consisting only of cord-wrapped stick impressions crossing the lip, with similar short oblique markings on the interior rim.

Form:

Lips: Rounded or slightly flattened, but often roughened by decoration.

Rims: Everted.

Necks: Constricted.

Bodies and bases: Unknown.

Diagnostic features of the type: Cord-marked vessels with outflaring rims, which have cord-wrapped stick decoration only on the rounded lip and interior rim.

Temporal range: Late Point Peninsula.

Geographical range: Central New York and eastern Ontario.

Probable relationships of the type: The writers have discussed at length the possible identity of this type and the Levanna Cord-on-Cord type. The most noticeable difference is the flatter lip of the latter. That they are genetically related forms is indisputable and Jack's Reef Corded certainly gave rise to Levanna Cord-on-Cord. This is one of the best ceramic links between the Owasco and Point Peninsula aspects. In wider relationships a connection with the post-Hopewellian Woodland Cord-Marked type is suggested.

JACK'S REEF CORDED COLLAR (Fig. 38, *r*, *s*)

Paste:
Temper: Mainly quartz particles ranging from large to medium size (*ca.* 2 mm. to 6 mm. in diameter).
Texture: Interiors are porous, laminated, and quite coarse.
Color: Interiors and exteriors show considerable range from orange through various shades of brown to charcoal gray. There is a general tendency for the exterior surface to contrast more markedly with the interior paste than is the case with the interior surface.
Hardness: *Ca.* 2.3.
Surface finish: Exterior surfaces are always corded while interiors are either smooth or channeled.
Decoration:
Designs: Collar designs usually consist of parallel oblique lines of corded impressions. Cord-wrapped stick imprints usually cross the lips, while rim interiors bear oblique impressions.
Techniques: Edge of cord-wrapped paddle or corded-stick.
Form:
Rims: Straight and collared. The collars are usually thicker at the base than at the lip. They were formed by applying a fillet of clay around a thin rim. A few of the rims (3) have an interior channel and are exteriorly convex with a curved lip. These few sherds also have a much smoother surface. Perhaps with materials from more sites available these variations will become new types.
Lips: Usually flattened.
Necks, bodies, and bases: Unknown.
Diagnostic features of the type: Comprise short, flat collars bearing oblique lines of cord-wrapped stick or paddle edge impressions over a cord-roughened surface.
Temporal range: Late Point Peninsula times.
Geographical range: Central New York and eastern Ontario.
Probable relationships of the type: This is obviously related to the Jack's Reef Dentate Collar type but no prototype is known for either. These two types appear to inaugurate a long tradition of collared pots in the New York area. The Levanna Corded Collar type may very well be a direct descendant of this type, and the concept of the collar here employed may have been transmitted through still unknown channels to become involved in the rise of the Owasco Corded Collar type.

JACK'S REEF CORDED PUNCTATE (Fig. 38, *u*)

Paste:
Temper: Grit of medium size (*ca.* 2 mm. in diameter).
Texture: The sherds are crackled and flaky, and cross sections show the interiors to be contorted and porous.
Color: The surfaces range in color from salmon red to charcoal gray. In cross section both surfaces contrast markedly with the black interior.
Hardness: *Ca.* 2.5.
Surface finish: Cord-marked.
Decoration:
Designs: Several rows of punctations on both the rim and neck.
Techniques: The punctations were made with the corner of a cord-wrapped paddle.
Form:
Lips: Rounded.
Rims: Outflaring.
Necks, bodies, and bases: Unknown.
Diagnostic features of the type: Corded-punctate decorations.
Temporal range: Closing Point Peninsula times.
Geographical range: Jack's Reef site in central New York.
Probable relationships of the type: The Wickham Punctate type may be ancestral to this type, which is very similar to, and very probably ancestral to, the Wickham Corded Punctate type of the Owasco.

THE OWASCO SERIES

The Owasco series is characterized by corded-stick ornamentation, the absence of body decoration, flattened and often splayed-out lips, and the paddle-and-anvil method of manufacture. The interior surface is smooth, the exterior surface cord-impressed or, in the later Castle Creek Focus, sometimes check-stamped. Necks are prevailingly smooth to receive decoration extending down from the rim. Bodies are elongate and bases conoidal in the Canandaigua Focus, elongate or semiglobular with rounded bases in the Castle Creek Focus. In general, the vessels are of relatively large size, ranging from a capacity of approximately two gallons upward to twelve or more gallons.

WICKHAM CORDED PUNCTATE (Figs. 39, *a*; 41, *f*)[10]

Paste:
Temper: Generally speaking, the tempering element is larger than in the other sherds of the Owasco series, being from 2 to 4 mm. in diameter and usually of quartz or crushed crystalline rock.
Texture: Often laminated and rather crumbly.
Color: Sherd exteriors range from orange to very dark brown. In cross section a gradual transition from a black interior to a lighter exterior is seen.
Hardness: 2.0 (or less).
Surface finish: By impression of either a cord-wrapped paddle or a dowel. One of two restored pots has smoothed-over cord surfacing. Rarely the necks have been smoothed.
Decoration:
Designs: The most distinctive element of the design is the punctation on the rim. Usually there is a single row of encircling punctations about an inch below the lip and rarely, a second series below the first. Occasionally there may be a single row around the rim and from one to three lines of punctations about

[10] Cf. the detailed drawings in Ritchie, 1944, Pl. 20, *4*.

the neck. Prevailingly, between the punctation and the lip occur short oblique cord-wrapped stick impressions. Lips are decorated in 50 per cent of the cases and have corded impressions either encircling or crossing them. Most rim interiors are obliquely corded.

Techniques: All decoration is done with a corded-stick or edge of a cord-wrapped paddle. Even the punctations seem to have been executed with the corner of the paddle or end of the stick.

Form:

Rims: Rims range from insloping through mildly to moderately everted. There appears to be no valid correlation between these two rim shapes and the various kinds of designs employed.

Lips: Usually flattened and slightly thickened.

Necks: Constricted.

Bodies: Elongated.

Bases: Conoidal.

Diagnostic features of the type: Simple punctations encircling an insloping or slightly everted rim.

Temporal significance: All sherds of this type are confined to early Owasco times.

Spatial significance: The type is known only from central New York.

Relationships of the type: It is probably derived from the earlier Jack's Reef Corded Punctate of the Point Peninsula culture. Similar punctations are to be found on an Owasco-like ware at a site near Chatham, Ontario.

CARPENTER BROOK CORD-ON-CORD (Figs. 39, *b*, *c*; 41, *g*)

Paste:

Temper: Medium sized (*ca.* 2 mm. in diameter, except at the Carpenter Brook site, where the size is slightly greater) pieces of quartz or pulverized crystalline rock.

Texture: The sherds are flaky and the interiors show a laminated structure which is often contorted.

Color: There is a wide range in color from orange or terra-cotta, through buff and brown, to black on the exteriors with the interior almost invariably black, except for the Carpenter Brook series in which the sherds are often orange throughout.[11]

Hardness: Average *ca.* 2.1.

Surface finish: Cord-marked, sometimes ridge-marked, as in Levanna Cord-on-Cord.

Decoration:

Designs: In this type all the designs characterizing the Owasco Corded Oblique, Owasco Herringbone, and Owasco Platted types are to be found superimposed upon a corded-surface finish. Attempts were made to subdivide this type on the basis of design but without success, for trends appeared to be the same for each variant. That is, this form as a whole is predominant at Carpenter Brook, slightly less so at Wickham, and is greatly reduced at Levanna, the last site of its occurrence.

Techniques: The designs were made by the impressions of a cord-wrapped stick or the edge of a cord-wrapped paddle.

Form:

Rims: Outflaring.

Lips: Flat.

Necks: Constricted.

Bodies: Elongated.

Bases: Conoidal.

Diagnostic features of the type: The diagnostic features of the type are corded-stick decorations upon the outflaring rim of a vessel which has been cord-malleated over the entire exterior surface.

Temporal range: Early Owasco.

Geographical range: Much of New York, part of lower Ontario, northeastern Pennsylvania, and northwestern New Jersey.

Probable relationships of the type: This type may have developed out of the combined concepts of the Point Peninsula Corded and Jack's Reef Corded types, and may have in turn given rise to the Owasco Corded Horizontal, Owasco Oblique, Owasco Herringbone, and Owasco Platted types.

LEVANNA CORDED COLLAR (Fig. 39, *d*)

Paste:

Temper: Medium-sized fragments of quartz or pulverized crystalline rock.

Texture: In cross section the sherds show porous, laminated paste, sometimes contorted.

Color: Dark brown, buff, or gray on exterior and interior surfaces. The interior paste is somewhat lighter.

Hardness: *Ca.* 2.5.

Surface finish: Consists of cord-wrapped paddle impressions running vertically to the lip. Interiors always smooth.

Decoration: None.

Form:

Rims: Slightly everted. Has low, thin, irregular collar evidently made by applying thin strip of clay. Collar cord-impressed.

Lips: Rounded or flattened.

Necks: Slightly constricted.

Bodies and bases: Unknown.

Diagnostic features of the type: A low, flat, corded collar on a weakly outflaring-rimmed vessel with cord-malleated surface.

Temporal range: Very early Owasco times.

Geographical range: Known only from the Levanna site, where it constitutes a very minor element.

Probable relationships of the type: Some specimens are almost indistinguishable from the Jack's Reef Corded Collar type. The interior surface is, however, always smooth, never channeled as is often the case in the latter type. Also, the rim is slightly everted and the lip is more often flattened. The two types are clearly genetically related and afford one of the strongest continuities between the Point Peninsula and Owasco cultures.

[11] This, however, may be due to water leaching during their long deposition in a ceremonial pottery dump in the brook bed (Ritchie, 1947, pp. 56–60).

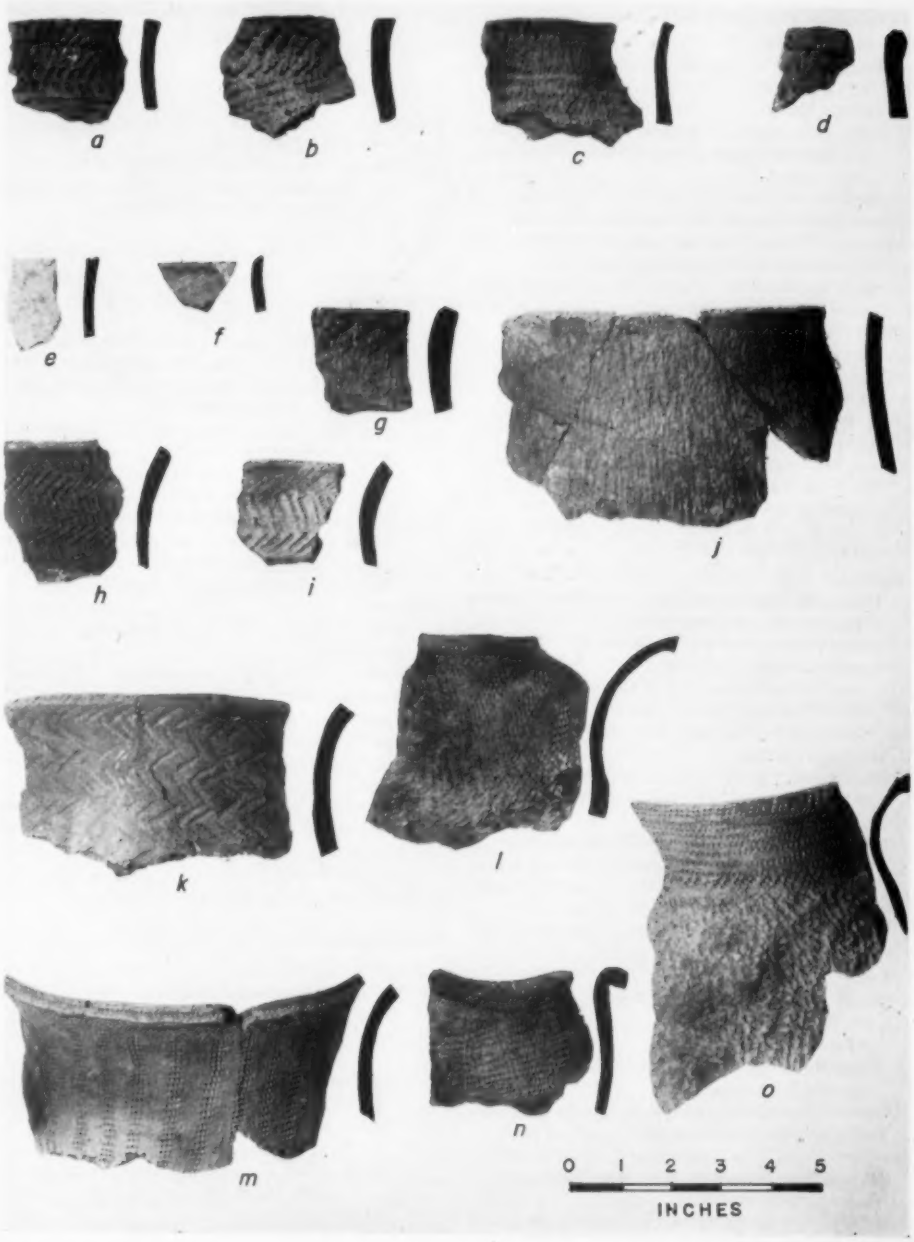

FIG. 39. Pottery types of the Owasco series, New York State: *a*, Wickham Corded Punctate; *b*, *c*, Carpenter Brook Cord-on-Cord; *d*, Levanna Corded Collar; *e*, *f*, Canandaigua Plain; *g*, *j*, Levanna Cord-on-Cord; *h*, *i*, *k*, Owasco Herringbone; *l–n*, Owasco Platted; *o*, Owasco Corded Horizontal.

CANANDAIGUA PLAIN (Fig. 39, *e*, *f*)

Paste:
Temper: Grit of medium size made from crushed crystalline rock.
Texture: Flaky.
Color: Varies from gray to black. In cross section there is a gradual transition from an interior black to an exterior gray.
Hardness: *Ca.* 2.0.
Surface finish: Unknown, although necks are smooth.
Decoration: The only decoration is on the lip and consists of cord-wrapped stick impressions encircling or crossing it. The majority of specimens are wholly plain. Corded oblique lines rarely occur on the rim interior.
Form:
Rims: Outflaring.
Lips: Flat.
Necks, bodies, and bases: Not known.
Diagnostic features of the type: Plain, outflaring rims.
Temporal range: Only during Middle Owasco times.
Geographical range: The Finger Lakes region of central New York.
Probable relationships of the type: Unknown.

LEVANNA CORD-ON-CORD (Fig. 39, *g*, *j*)

Paste:
Temper: Medium-sized (2 mm. in diameter) pieces of quartz or pulverized crystalline rock.
Texture: In cross section the sherds show laminated paste, sometimes contorted.
Color: Usually charcoal gray to black. In cross section the interior and exterior zones are dark, indicating that the firing took place in a reducing atmosphere.
Hardness: *Ca.* 2.5.
Surface finish: Usually imparted with a cord-wrapped paddle, occasionally with a cord-wrapped dowel.
Decoration:
Designs: When it occurs, the decoration consists of linear or cord-wrapped paddle-edge impressions across the lip. Rarely a single cord imprint medially encircles the lip.
Techniques: Either by linear impression or the edge of a corded paddle or corded stick.
Form:
Rims: Slightly to moderately everted.
Lips: Flattened.
Necks: Constricted.
Bodies and bases: Unknown. Probably elongated with conoidal bottom.
Diagnostic features of the type: Corded surface finish, outflaring rim, with decoration only on the lip, if at all.
Temporal range: This type has its inception in earliest Owasco times and continues on into the beginning of the Late Owasco period.
Geographical range: Unknown. Similar forms are known from northern New Jersey.
Probable relationships of the type: It appears to be derived from the Jack's Reef Corded type of the Point Peninsula culture. In fact, the main distinction is that the latter usually has a rounded lip while in the former the lip is prevailingly flattened. This type constitutes one of the best continuities between the Point Peninsula and Owasco cultures.

CASTLE CREEK PUNCTATE (Fig. 40, *e–g*)[12]

Paste:
Temper: Grit of small size.
Texture: Cross section shows a laminated texture.
Color: The exteriors range from charcoal gray to yellow ocher. The interiors are usually black.
Hardness: *Ca.* 2.5.
Surface finish: Two intact pots are finely cord-marked, as are four sherds. One sherd appears to be fabric impressed.
Decoration:
Designs: Consist of rows of punctations on the collar. This is associated with either incised lines, punctations, plats of cord-wrapped stick, or oblique lines of similar impressions on the neck.
Techniques: The punctations were made with a tubular punch, perhaps a bird bone *ca.* ¼ in. in diameter, or with a pointed or triangular stylus. The former is most common at the Castle Creek site. However, since the few examples of this decorative technique are so similar, and since the stylus-made types appear at both the Sackett and Castle Creek sites, we have included them all in one type.
Form:
Rims: All sherds of this type are collared.
Lips: Flat.
Necks: Concave, usually smoothed and decorated.
Bodies and bases: Globular with round bottom.
Appendages: One or two vertical lugs are often applied to the collar, usually below the castellations.
Diagnostic features of the type: Punctations on a collared vessel.
Temporal and geographical ranges: Sherds of this type are found at the Sackett farm, Castle Creek and Bell-Philhower sites and would appear to belong to Middle and Late Owasco times.
Probable relationships of the type: Unknown.

OWASCO HERRINGBONE (Fig. 39, *h*, *i*, *k*)[13]

Paste:
Temper: Grit showing considerable variation in size and quantity.
Texture: Flaky and at the Wickham site almost crumbly. In general, there is an improvement in texture and hardness from Early to Late Owasco times, but the change is not great enough to allow the formulation of new types.
Color: Exteriors range in color from charcoal gray to burnt sienna. Interiors are usually very dark. In cross section the sherds show an abrupt change in color near the center.

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[12] Cf. the detailed drawings in Ritchie, 1944, Pls. 19, *5*; 20, *5*.

[13] Cf. the detailed drawings in Ritchie, 1944, Pls. 18, *2*; 19, *3*; 20, *6*.

Surface finish: One whole pot and one sherd are coarsely cord- or fabric-marked; two pots and ten sherds have finely cord-marked body surfaces. Necks are smooth.

Decoration:

Designs: Extending down from the lip is a herringbone pattern consisting of parallel horizontal rows of elements which are oblique in alternate directions. Cord-wrapped stick impressions or linear corded impressions cross the lip and in some cases they encircle the upper part of the rim. Rarely the lip is unembellished. Usually there are oblique impressions on the rim interior.

Techniques: Usually the decoration was achieved with a cord-wrapped stick or the edge of a cord-wrapped paddle, impressed on the wet clay surface. Commonly only five to ten cord impressions are visible on a single line, but the fact that one end of the impression is more distinct than the other implies that the operator may have been using only a part of one end of the decorating implement. A few sherds have designs done by a short ($\frac{1}{2}$ to 1 inch), simple linear stamp.

Form:

Rims: Usually outflaring. In a few examples weak castellations occur.

Lips: Always flattened and sometimes roughened by decorating with a corded tool.

Necks: Constricted.

Bodies: Elongated.

Bases: Conoidal in two cases (Canadaigua Focus), round in one (Castle Creek Focus).

Diagnostic features of the type: A corded-herringbone decoration on an outflaring rim.

Temporal range: This type occurs throughout Owasco times and is also present in the late Point Peninsula period. It reached its greatest popularity in the Middle Owasco horizon.

Geographical range: The type has a very wide distribution in New York State, northern New Jersey, and Pennsylvania. The same or a very similar type appears on the Ontario peninsula in Canada at the Uren site, and at Chatham, Ontario. In coastal New England some similar sherds are also found.

Probable relationships of the type: It seems to have been born in Late Point Peninsula times and the prototype may have been a rocker-stamp.

OWASCO PLATTED (Figs. 39, *l–n;* 41, *d*)[14]

Paste:

Temper: Grit of medium size (*ca.* 2 to 3 mm. in diameter).

Texture: The sherds are flaky and, in the earlier components (Wickham, Carpenter Brook, and Jack's Reef), crumbly in texture.

Color: Although there is some difference from site to site, the sherd exterior is usually charcoal gray (later examples are sometimes orange) and the interior black. The cross section shows a gradual transition from the black interior to the gray exterior.

Hardness: Average 2.0.

Surface finish: Body surface finish on four restored pots is fine cord-marking; one of eight sherds shows smoothed-over cord marks; the remainder are finely cord-marked. Neck surfaces are smooth.

Decoration:

Designs: The commonest design is a plat of corded-stick imprints on the neck. These plats consist of short, horizontal, cord-wrapped stick impressions (about 1 inch long), one above the other, which form vertical or oblique rows. Usually above these plats the exterior and interior rim surfaces bear short, oblique, corded-stick impressions reaching across the lip. Some variation of decoration is present, for occasionally the accessory embellishments are absent from the rim, and in a few examples from each site there is a herringbone pattern consisting of two oblique corded impressions above the plats.

Techniques: The plats were formed by impressing a cord-wound stick or cord-wrapped paddle edge, having three to five cords, on a smoothed wet clay surface.

Form:

Rims: Outflaring.

Lips: Usually flattened.

Necks: Constricted.

Bodies and bases: Whole pots show an elongated body with a conoidal base in the earlier period and a rounded one from Castle Creek times on.

Diagnostic features of the type: Vertical or oblique plats of corded-stick imprints on an outflaring rim.

Temporal range: This type is present throughout the Owasco period and becomes more dominant in late Owasco times.

Geographical range: New York State, northeastern Pennsylvania, northwestern New Jersey. Similar types appear in the Sebonac and Bowman's Brook cultures of the Long Island Sound area.

Probable relationships of the type: The ancestral type is unknown, but may be foreshadowed in the late Point Peninsula. This style of decoration seems to be waning in very late Owasco times. It also appears related to the Owasco Horizontal type, as it shows the same trend in time.

OWASCO CORDED HORIZONTAL (Fig. 39, *o;* Fig. 41, *a*)[15]

Paste: Grit having considerable range in size and quantity.

Surface finish: Three whole pots and a number of sherds exhibit fine cord-marked bodies, with two sherd exceptions, one of which is coarsely corded or fabric-marked, the other greatly smoothed-over cord-marked. Necks are smooth.

Decoration:

Designs: The dominant design is a series of short ob-

[14] Cf. the detailed drawings in Ritchie, 1944, Pls. 18, *3, 4;* 20, *2, 3.*

[15] Cf. the detailed drawings in Ritchie, 1944, Pls. 17, *5;* 19, *4.*

lique impressions above rows of horizontal impressions that encircle the neck and upper rim. On some of the sherds the upper oblique lines are absent and the horizontal rows extend to the lip. Lips may be decorated by cross or parallel impressions or may bear no decoration at all. The rim interiors are usually embellished by oblique impressions.

Techniques: The design appears to have been executed with a cord-wrapped stick or the edge of a cord-wrapped paddle. The horizontal encircling lines are composed of a series of neatly fitting corded-stick imprints.

Form:

Rims: Outflaring.

Lips: Flattened and sometimes cord-roughened.

Necks: Constricted.

Bodies: Elongated.

Bases: Conoidal on the three entire vessels, which pertain to the early or Canandaigua Focus.

Diagnostic features of the type: Horizontal cord-wrapped stick impressions, with or without oblique corded decorations above the main theme, on outflaring rims.

Temporal range: This type appears early, at the Carpenter Brook site, and continues throughout the Owasco period, increasing in popularity.

Geographical range: Much of New York State, northeastern Pennsylvania, northwestern New Jersey, and western Vermont.

Probable relationships of the type: Similar types appear in the western Long Island Sound area, in Massachusetts, and in the upper levels of the Waterside shell heap in Maine. This suggests a temporal link between these various cultures. The Vinette Dentate and Point Peninsula Corded types may be prototypic, while the Owasco Corded Collar type may have developed therefrom.

OWASCO CORDED OBLIQUE (Fig. 40, *a*, *b*)[16]

Paste: Grit of varying size and quantity.

Surface finish: Four whole pots and some dozen sherds show fine cord-marked surfacing. Necks are smooth.

Decoration:

Designs: The dominant decoration is a series of short, parallel, oblique impressions on the rim exterior and interior. Occasionally these lines extend down onto the neck. Sometimes a second offset row occurs below the first. A possible subtype has only two or three parallel, oblique corded-stick impressions extending from the rim down over the neck.

Techniques: The motifs were executed with cord-wrapped stick or cord-wrapped paddle edges.

Form:

Rims: Outflaring. Weak rim points or castellations are present on several sherds.

Lips: Flattened.

Necks: Constricted.

Bodies and bases: Elongated in the earlier (Canandaigua) focus with conoidal base; semiglobular or globular with rounded bottom in Castle Creek times.

Diagnostic features of the type: Oblique cord-wrapped stick impressions on a smooth outflaring rim.

Temporal range: Occurs throughout the Owasco period reaching its dominance in Middle Owasco times.

Geographical range: Much of New York, northeastern Pennsylvania, and northwestern New Jersey.

Probable relationships of the type: Unknown.

OWASCO CORDED COLLAR (Figs. 40, *c*, *d*, *h*; 41, *e*)[17]

Paste:

Temper: Crushed shale or granitic grog (*ca.* 2 mm. in diameter).

Texture: Flaky and somewhat porous.

Color: Surface range from charcoal gray to ocher yellow. In cross section the sherds are black from the interior to almost the exterior surface, where the color changes sharply.

Hardness: *Ca.* 2.5.

Surface finish: The seven complete pots and six sherds available have finely cord-marked surfaces.

Decoration:

Designs: The dominant collar design consists of from three to six (usually three) horizontal rows of corded-stick impressions. Often at a castellation, and sometimes where this feature is absent, there are three rows of vertical or diagonal cord-wrapped stick impressions. A few sherds exhibit oblique corded-stick impressions on the collar, while on still others are opposed triangles composed of similar impressions. However, since we were unable to establish a significant difference between these sherds and the others of this type, we did not feel justified in defining a new type. On the vessel neck may occur plats, oblique lines, horizontal rows, or three parallel oblique lines forming triangles of corded-stick impressions.

Techniques: All decoration is by cord-wrapped paddle edge or cord-wound stick.

Form:

Rims: All have collars with a channeled interior. There is a general tendency for the rims from the later sites to be straighter and slightly taller. However, the majority have a convex exterior.

Lips: Usually flat. The earlier sherds from the Sackett site sometimes have plain lips, while the later ones are usually decorated.

Necks: Invariably constricted.

Bodies: Range from elongated to globular.

Bases: Round in all known examples which pertain to the Castle Creek Focus.

Appendages: Two vertical lugs were often applied to the collar below the castellations.

Diagnostic features of the type: A collar with horizontal rows of cord-wrapped stick impressions, combined with a similar style of neck ornamentation.

Temporal range: The type first appeared in Middle Owasco times (although two sherds were found at the

[16] Cf. the detailed drawings in Ritchie, 1944, Pl. 17, *1*.

[17] Cf. the detailed drawings in Ritchie, 1944, Pls. 17, *2*; 18, *1*; 19, *1*, *2*.

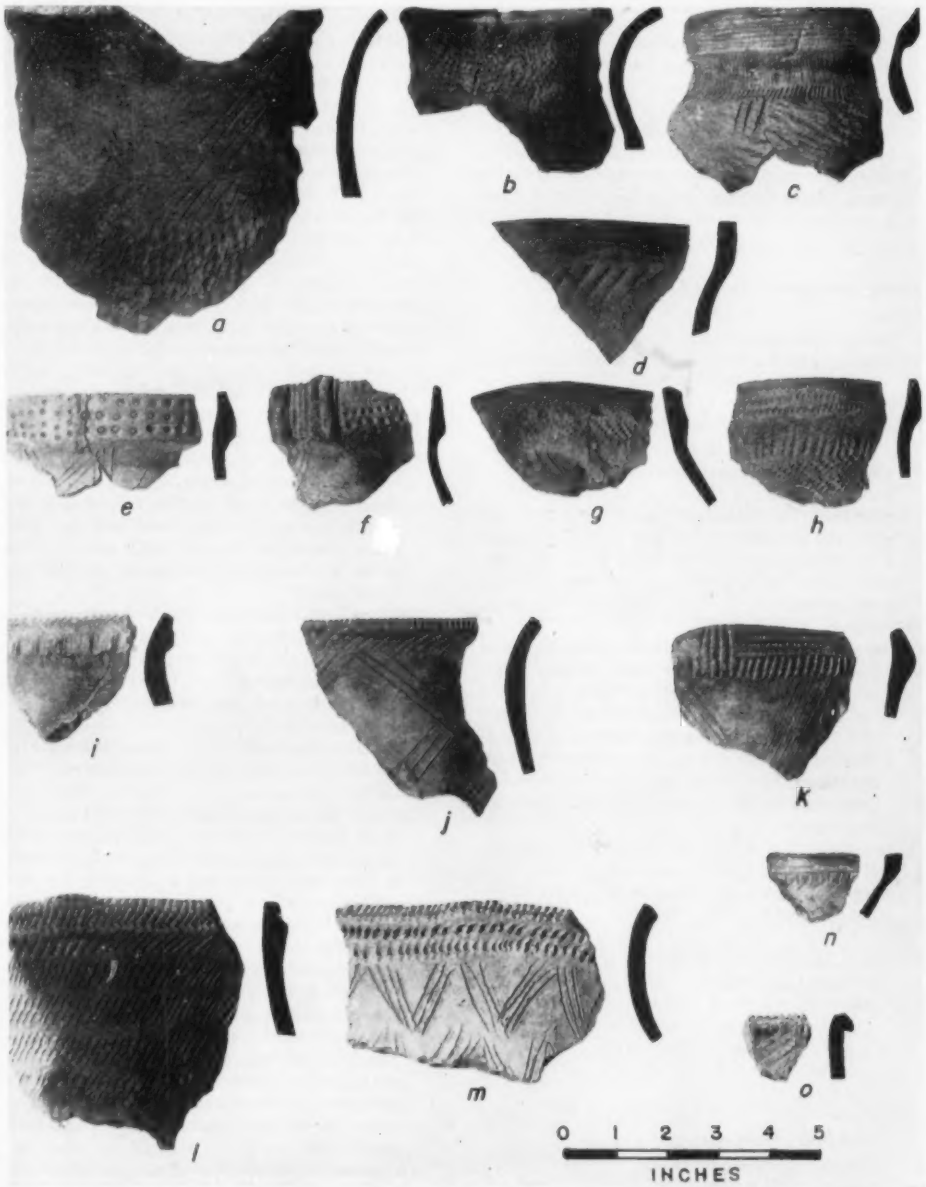

FIG. 40. Pottery types of the Owasco series, New York State: *a*, *b*, Owasco Corded Oblique; *c*, *d*, *h*, Owasco Corded Collar; *e–g*, Castle Creek Punctate; *i*, *l*, Castle Creek Beaded; *j*, *m*, Castle Creek Incised Neck; *k*, Bainbridge Collared Incised; *n*, Bainbridge Linear; *o*, Bainbridge Notched Lip.

Wickham station) and constituted a major Late Owasco form.

Geographical range: The type is found over much of New York State east of the Genesee Valley, in northeastern Pennsylvania, and northwestern New Jersey.

Probable relationships of the type: We believe this type to have great chronological significance and it may temporally link cultures over a wide area of the northeastern United States. The prototype may be either the Levanna Corded Collar or Jack's Reef Collared types. It would appear to MacNeish that this type develops into the early Mohawk Oak Hill Corded.

CASTLE CREEK BEADED (Fig. 40, *i, l*)[18]

Paste:

Temper: Grit of *ca.* 1 mm. in diameter.

Texture: The sherd interior is laminated and has a tendency to be flaky.

Color: Charcoal gray to cinnamon brown. In cross section the sherds show relatively even firing, with the inside wall only slightly darker than the exterior wall, while the centers are darker than either.

Hardness: *Ca.* 2.

Surface finish: Forty sherds of one pot can be connected with a rim and these sherds show coarse cord-roughening. Three sherds from as many vessels are finely cord-marked. A large restored pot has a check-stamped body.

Decoration:

Design: On the exterior rim there are usually two or three horizontal rows of short vertical lines. Rarely rows of punctations replace the other design elements. Below these are lines on the neck which may be either incised triangles or horizontal lines of cord-wrapped stick impressions, or a continuation of the rim design. Lips usually have parallel transverse lines, while the lip interior always bears short oblique lines.

Techniques: The oblique, vertical, or horizontal rows of lines on the rim exterior are usually made with the edge of a cord-wrapped paddle, or a linear stamp, and are about ¾ of an inch long.

Form:

Rims: Characteristic of this pottery type is a rim with a flattened (and often broadened) lip having a small bead or ridge below it. Oblique or vertical elements of the design occur above and below this bead.

Lips: Usually flattened and decorated.

Necks: Concave or insloping with the rims outflaring from them.

Bodies and bases: The one complete pot has an elongated body with rounded base.

Appendages: Castellations appear as slight elevations of the lip. The bead is appliquéd to the vessel rim with the lower portion smoothed into it, while the upper portion is at right angles to it. The line of fusion is often evident.

[18] Cf. the detailed drawings in Ritchie, 1944, Pls. 17, *4;* 19, *6.*

Diagnostic features of the type: Pots with a beaded rim having a row of short vertical or oblique design elements above the bead and another below it.

Temporal and geographical ranges of the type: The type occurs mainly at the Castle Creek site and rarely at the Bainbridge, Bell-Philhower, and Calkins farm sites. All these sites are of late Owasco times though not necessarily at the end of the period. Three sherds of this type were found at the Wickham site and may represent the beginning of the type.

Probable relationships of the type: It is possible that this type arose from the Owasco Oblique type, flourished during the Castle Creek stage, then died out leaving no descendants. Of particular significance are the Wickham sherds which may indicate a possible areal relationship, viz., of Wickham to Castle Creek rather than Wickham to Levanna.

CASTLE CREEK INCISED NECK (Fig. 40, *j, m*)[19]

Paste:

Temper: Small to large particles (less than 1 mm. to more than 3 mm., occasionally to 6 mm. in diameter) of pulverized crystalline rock. This was obviously derived from the large pebbles of burned, friable, granitic and gneissic rocks found on Owasco sites, which were probably crushed with a hammerstone in the peculiar mortars having one or more deep conical pits.[20]

Texture: Coarse, sometimes laminated and porous.

Color: Buff, brown, gray, or orange on both surfaces and extending inward for some 2–3 mm. from the outer surface and *ca.* ½ mm. from the inner surface. Paste interior nearly black in most instances.

Hardness: *Ca.* 2.5.

Surface finish: Fine cord in four instances, coarse cord or rough fabric impression on body of restored pot.

Decoration:

Designs: The primary element consists of groups of rudely incised parallel lines placed obliquely on the neck to form open triangles. Occasionally two zones of these occur, in one case separated by a narrow band of punctations. On this same sherd a plat composed of identical punctations obliquely transverses the doubly incised neck. In every instance the surmounting rim area is embellished with a single, or much more commonly, a double row of oblique lines, often constituting a rude herringbone design. This was executed with a corded stick or a linear punch. The lip is obliquely and/or horizontally cord-imprinted, and similar short impressions appear on the inner rim. The shoulder also carries a single line of oblique corded-stick imprints or in one case weak punctations.

Techniques: The neck ornamentation is incised in a crude, hesitant fashion, clearly demonstrating what we know from the development of Owasco ceramics, viz., that the potter was experimenting with an un-

[19] Cf. the detailed drawings in Ritchie, 1944, Pls. 17, *6;* 18, *6.*

[20] Ritchie, 1934, Pl. XVI, *1;* 1944, Pl. 27, *11.*

familiar technique. Cord-wrapped stick impressions, in the old tradition, and rarely punctation, were employed in the remainder of the embellishment.

Form:

Rims: Everted.

Lips: Flat and sometimes outsloping. Weak rim points or castellations often occur.

Necks: Concave and smooth, with incised decoration.

Bodies: Semiglobular.

Bases: Round.

Diagnostic features of the type: Incised triangular motifs on the vessel neck.

Temporal range: Late Owasco times.

Geographical range: This type is best represented at the Castle Creek site but it is also present at Bainbridge.

Probable relationships of the type: This is a logical prototype for the Bainbridge Collared Incised type. It is one of several types (Castle Creek Beaded, Castle Creek Punctate) of the same time period which frequently portray incised neck decoration.

BAINBRIDGE COLLARED INCISED[21] (Fig. 40, *k*)[22]

Paste:

Temper: Grit usually of about 1 mm. or less in diameter, with occasionally a large inclusion (3 mm. in diameter).

Texture: Coarse and laminated, with a tendency toward flaking.

Color: Colors range from a yellow ocher to a charcoal gray on both surfaces. Paste interior is almost always black. Sherds in cross section show the black extending to about 1 mm. from the exterior surface where there is a distinct change to lighter color, superficially resembling a slip. We interpret this to mean that a quick, hot fire was applied to the exterior of the pot and that in all probability the vessel was fired with its mouth inverted, so that fire could not directly reach the interior, which was thus in a reducing atmosphere.

Hardness: Exteriors are about 2.5 with interior much softer.

Surface finish: Of seven whole pots, five have finely cord-marked bodies, the remaining two being check-stamped.

Decoration:

Designs: The collars of this type usually bear three encircling rows of cord-wrapped, paddle-edge decoration. Sometimes these rows are broken by three vertical lines of corded-stick marks, usually occurring under castellations. In rare cases there is a series of oblique lines of corded-stick imprints; two sherds present triangular decorations done in the same technique. The lip bears either a single-corded stick impression horizontally placed, or small, evenly spaced (*ca.* ¼ inch apart), transverse, cord-wrapped stick lines. At the base of the collar there may be short vertical corded-stick impressions. The necks are always rudely incised with lines, usually in sets of three, forming rhomboids or triangles. At the junction of the neck and body short, oblique, cord-impressed lines often occur.

Techniques: Incising characterizes the neck ornamentation, while cord-wrapped stick or paddle-edge impressions are found upon the collar.

Form:

Rims: All have a definite collar of varying height, prevailingly low, with a slight interior channel and a convex exterior.

Lips: Flat.

Necks: Concave and smooth, with incised decoration.

Bodies: Semiglobular.

Bases: Round.

Appendages: A vertically applied ridge of clay is often found below the castellations.

Diagnostic features of the type: Incised lines on the vessel neck, and collar decorated with cord-wrapped stick impressions.

Temporal range: The type appears only in late Owasco times.

Geographical range: This type predominates at the Bainbridge site and a few examples occur at the Castle Creek and Bell-Philhower sites.

Probable relationships of the type: This form seems to have emerged from a union of the concepts involved in the earlier Owasco Corded Collar and the late Castle Creek Incised Neck types, and seems to be related to Bainbridge Linear. Sherds similar to the type occur at the Ivey site in Jefferson Co., New York, and in upper levels of the Chipman's Point Rock Shelter at Orwell, Vermont. The subsequent development of this type is not known, but it may have given rise to the Chance Incised and Oak Hill Corded types of early Mohawk, in which incised neck lines forming triangles occasionally occur.

BAINBRIDGE LINEAR (Fig. 40, *n;* Fig. 41, *c*)

Paste:

Temper: Small pieces of shale.

Texture: The sherds have a gritty feel, have a tendency to be flaky, and the cross section shows laminations.

Color: The inside of the sherds is usually black with exteriors ranging from a yellow ocher to charred gray color. This would appear to indicate a low firing temperature resulting in oxidation of the exteriors.

Hardness: Average 2.5.

Surface finish: The one whole pot shows a check-stamped surface. However, since fine cord-marking and check-stamping are the dominant surface finishes at the Bainbridge component it is probable that either style is correlated with this type.

Decoration:

Designs: Three horizontal lines encompass the center of the collar with short vertical lines above and below them. At the two castellations of the whole pot there are three vertical parallel lines. On the lip there are two parallel incised lines. Below the collar

[21] Only a small sample (25 sherds) was examined, as many of the total are whole pots.

[22] Cf. the detailed drawings in Ritchie, 1944, Pls. 17, *3;* 18, *5.*

the decoration consists of either a series of parallel, oblique, linear markings or cord-wrapped, paddle-edge impressions. Necks appear to be decorated by three parallel incised lines forming rhomboids.

Techniques: On the collar and the lip the decoration consists of short connecting incisions or overlapping linear punctations, while just below the collar there may be either cord-wrapped, paddle-edge impressions, or linear punctation. Neck decoration is incised.

Form:

Rims: A ¾ to 1 inch high thin collar was added to the rim. The collar interior shows a channel, while the exterior is slightly convex. The collar may either increase or decrease in thickness toward the lip.

Lips: Flat with two parallel lines of linear impressions on the surface.

Necks: Concave, smooth, and bear incised decoration.

Bodies: Elongated with a tendency toward globularity.

Bases: Round.

Appendages: Two short, pointed castellations appear on one vessel.

Diagnostic features on the type: Horizontal bands of linear impressed decoration on a short collar, combined with incised decoration on the neck.

Temporal range: The type appears only during late Owasco time, and may be considered a terminal Owasco form.

Geographical range: It has been found only at the Bainbridge site near Bainbridge, Chenango Co., New York, and at the Bell-Philhower site near Montague, Sussex Co., New Jersey.

Probable relationships of the type: The earlier and partly contemporaneous Bainbridge Collared Incised type would seem to be a logical prototype for this form. The sherds from Goodyear Lake near Oneonta, New York; from the Oak Hill site near Ft. Plain, New York; and those from the upper levels of the Chipman's Point site near Orwell, Vermont (called early Mohawk by MacNeish), which have parallel lines of linear punctation on a high collar with short vertical punctations above and below them are sufficiently similar to suggest some sort of relationship.

BAINBRIDGE NOTCHED LIP (Fig. 40, *o*)

Paste:

Temper: Grit, ranging from pieces ½ cm. to 2 cm. in diameter.

Texture: Coarse and laminated.

Color: Ranges from a burnt sienna to a charcoal gray. The exterior surface and *ca.* one-half of the exterior wall are fired to an orange color (oxidized), while the interior is black and flaky. Since the sherds are relatively thin (except at the lip), measuring about 4 mm., this may account for the better firing.

Hardness: *Ca.* 3.0.

Surface finish: It was impossible to correlate the rims with the body sherds, but since this type is dominant at Bainbridge, where finely cord-marked and check-stamped surfaces predominated, it was probably one of these.

Decoration:

Designs: The decoration on the flattened and overhanging lip consists of one or two incised lines encircling the center of the lip, which is notched along either edge. On the inside of the rim there are oblique, parallel, incised lines, although at least one sherd has cord-wrapped paddle-edge impressions instead of incising. On the neck and rim occur rows of short, oblique, vertical impressions made by a cord-wrapped stick, or incised oblique lines.

Techniques: Incising is the dominant kind of decoration, although use of a cord-wrapped paddle-edge is combined with it on some neck sherds.

Form:

Rims: Generally outcurving and expanding. A portion of the rim at the lip slightly overhangs. Superficially it appears that a flat appliqué of clay was affixed to the lip.

Lips: Flattened to a great extent to receive decoration.

Necks: Definitely constricted.

Bodies and bases: No rim sherds could be connected with body sherds but the curvature of the neck sherds leads us to suspect that the bodies and bases were round.

Appendages: One rim sherd is slightly raised to form an incipient castellation.

Diagnostic features of the type: Chief differentiating features are the thickened lip with marginal notches and incised lines around the center.

Geographic and temporal ranges: The only sherds of this type were found at the Bainbridge site and are considered as belonging to very late Owasco times.

Probable relationships of the type: It is very similar in shape and design to the contemporaneous Bainbridge Collared type, although the technique of decoration differs. It is possible that both were derived from the thickened lip variants of the Owasco Herringbone and Owasco Horizontal types. The Bainbridge Notched

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EXPLANATION OF FIG. 41. *a*, Owasco Corded Horizontal, Angel site, near Mt. Upton, Chenango Co., N. Y.; *b*, Point Peninsula Rocker-Stamped, Wickham site, Oswego Co., N. Y.; *c*, Bainbridge Linear, Bainbridge site, Chenango Co., N. Y., *d*, Owasco Platted, Bell-Philhower site, Sussex Co., N. J.; *e*, Owasco Corded Collar, Bainbridge site, Chenango Co., N. Y.; *f*, Wickham Corded Punctate, Wickham site, Oswego Co., N. Y.; *g*, Carpenter Brook Cord-on-Cord, Fall Brook site, Livingston Co., N. Y. (Rochester Museum cat. nos.: *a*, AR28948; *b*, AR38200; *c*, AR28631; *d*, AR42071; *e*, AR28632; *f*, AR38424; *g*, AR34501.)

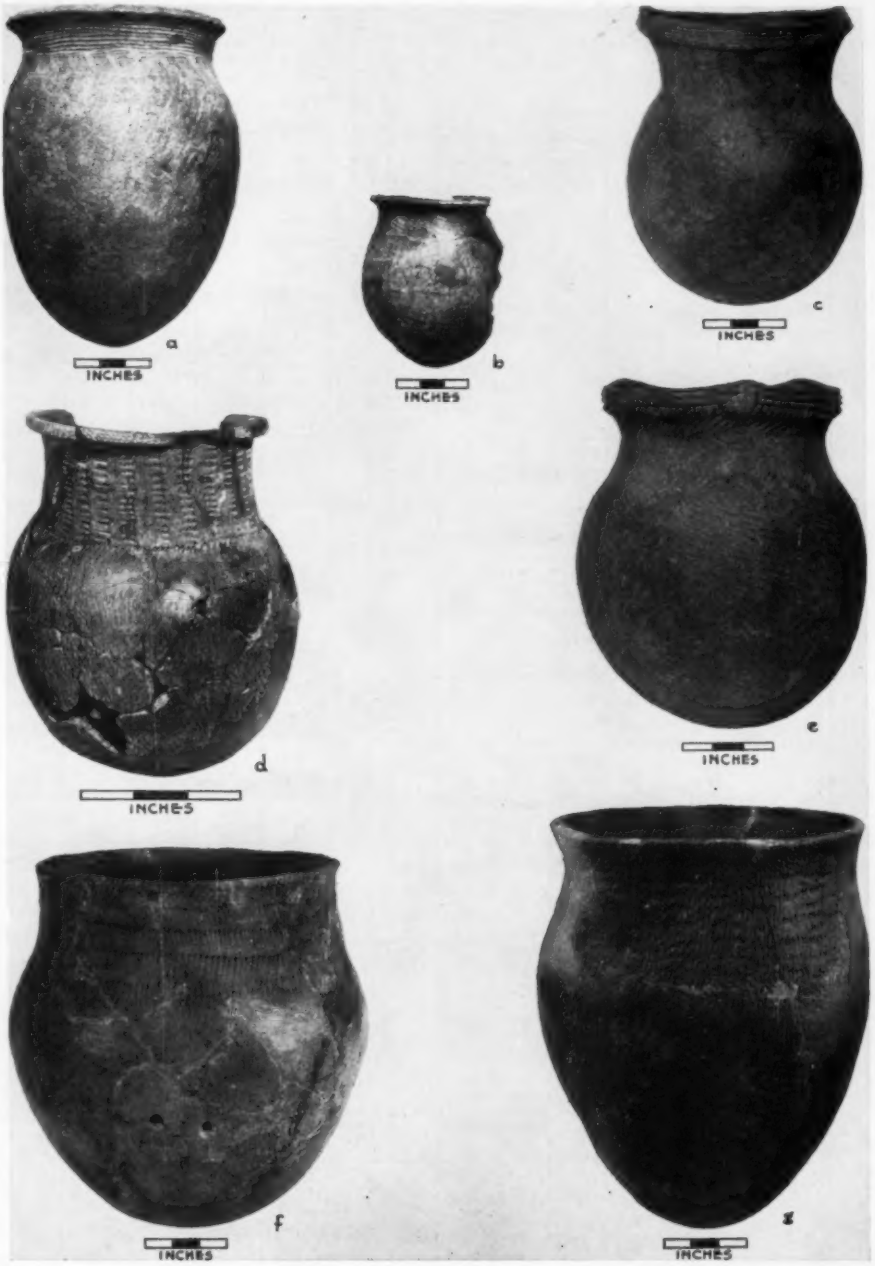

FIG. 41. Restored pottery vessels of the Point Peninsula and Owasco cultures. (See facing page for explanation.)

COMPONENTS \ TYPES	Wickham Corded Punctate	Carpenter Brook Cord-on-Cord	Levanna Corded Collar	Canandaigua Plain	Levanna Cord-on-Cord	Castle Creek Punctate	Owasco Herringbone	Owasco Platted	Owasco Corded Horizontal	Owasco Corded Oblique	Owasco Corded Collar	Castle Creek Beaded	Castle Creek Incised Neck	Bainbridge Collared Incised	Bainbridge Linear	Bainbridge Notched Lip
Bainbridge 363							.08 29	.05 20	.12 45	.02 7	.21 78	.02 8	.01 4	.39 140	.06 21	.03 10
Bell-Philhower 332						.01 3	.04 12	.37 121	.32 107	.07 23	.16 54	.015 5		.01 4	.005 2	
Castle Creek 446					.02 9	.02 10	.12 54	.17 76	.13 59	.15 66	.13 57	.12 54	.05 21	.09 40		
Sackett 391				.06 24	.09 35	.01 3	.13 50	.15 60	.03 11	.46 181	.07 27					
Levanna 192		.26 50	.04 8	.02 4	.29 56		.24 46	.03 6	.05 10	.06 12						
Wickham 902	.10 85	.61 553			.03 30		.04 36	.03 29	.12 106	.06 57	.005 3	.005 3				
Carpenter Brook 437	.20 89	.65 285			.05 20		.02 8	.03 14	.04 19	.004 2						

COMPONENTS \ TYPES	Vinette 1	Vinette Dentate	Vinette Complex Dentate	Point Peninsula Corded	Point Peninsula Rocker-stamped	Point Peninsula Plain	St Lawrence Pseudo Scallop Shell	Wickham Incised	Wickham Corded	Wickham Punctate	Kipp Island Criss-cross	Jack's Reef Dentate Collar	Jack's Reef Corded	Jack's Reef Corded Collar	Jack's Reef Corded Punctate
Jack's Reef 241		.126 30	.025 6	.16 39	.48 115	.025 6					.03 8	.04 9	.04 10	.06 15	.01 3
Upper levels of Vinette 732	.11 84	.18 132	.11 79	.10 70	.45 326	.02 15	.01 8	.01 7		.005 4	.002 2	.001 1	.001 1	.001 1	
Wickham 338	.18 61	.15 49	.11 37	.04 13	.20 67	.02 7	.03 10	.12 41	.02 7	.04 15	.02 8	.03 9	.02 8	.02 6	
Middle levels of Vinette 352	.66 234	.11 39	.05 16	.04 14	.12 42	.01 3	.01 2	.01 2							
Lower levels of Vinette 167	.88 147	.05 8	.01 1	.01 1	.06 10										

FIG. 42. Distribution of the New York pottery types: *top*, Owasco series; *bottom*, Point Peninsula series.

Lip type bears definite similarities to the Mohawk Notched type in rim shape, design, and design technique, but differs in that the latter type has no neck designs. MacNeish believes that the Bainbridge Notched Lip type is ancestral to the Mohawk tribal diagnostic form.

INTERPRETATIONS

Included in the type descriptions just given are brief references both to horizontal and vertical distributions, as well as to the possible genetic relationships of the types. The data on these significant points are admittedly fragmentary. From certain other sites which we believe to be very important no valid data whatever are available, because for the most part they were dug by amateurs without regard to the relationship of the material found and, in many cases, without the retention of a sufficient sample of the potsherds. In other instances sites explored by the Museum were too small to yield an adequate statistical sample. Wherever possible, however, we have alluded to such sites in the general reconstruction of our archaeological picture. Here in the final section, we shall concern ourselves primarily with component relationships and the broader affiliations implied in cultural classification, rather than with type comparisons.

In both the Point Peninsula and the Owasco series definite trends are observable and, indeed, certain of these trends appear to link the two discrete series, while in turn, some of the observable Owasco tendencies seem to continue on into Iroquois. Thus there is the suggestion in a part of the total ceramic seriation of continuity with change. However, there remains a substantial number of discontinuities between the respective aspects, a fact which suggests either that the key linking sites are still undug or that movements of new peoples have taken place from time to time, in which case the observable trends reflect varying measures of acculturation.

In the Point Peninsula seriation, which is in complete agreement with the stratigraphic evidence, the chief observable trends comprise a continuation throughout the entire temporal span of Hopewellian-like decorative techniques, i.e., rocker-stamping, dentate, and complex dentate, and an associated non-Hopewellian corded decorative feature (Fig. 42, *bottom*). The presence of this corded decoration in the lower level (Early Point Peninsula) at the Vinette site, even though as a mere trace, constitutes its earliest known occurrence anywhere, for, if our assumptions be correct, this level is of pre-Hopewellian age.[23] Subsequently, in late Hopewellian times, this type of embellishment seems to have disseminated southward, occurring, for example, as a minority ware in the Clear Lake site, Tazewell County, Illinois, and somewhat later in the Maples Mills Focus of the same state.[24] It is also present as a minor element of the Goodall Focus (late Hopewellian) in Michigan.[25] Recently Ritchie has found it at Rice Lake and elsewhere in lower Ontario.[26]

The pre-Hopewellian provenience of this type in the New York area is indicated by its association with Vinette 1 type sherds in the lower or Early Point Peninsula level of the Vinette component at Brewerton.[27] The closest affinities of Vinette 1 are with the Fayette Thick type in Kentucky and elsewhere, and with the Red Ocher Type 6 in Illinois,[28] both of which are on the Adena time level, as indicated by stratigraphy in Illinois and seriation of burial traits in Kentucky.[29] If this association of our sherds with the Adena be valid, then some of our Hopewellian pottery decorations have an earlier appearance in the northern than in the southern United States. The cultural assignment of Vinette 1 pottery is sustained by the total evidence of the other traits and by the fact that the Middlesex culture, with only this double-corded pottery type, has a majority of traits in common with Adena.[30]

In Middle Point Peninsula times (Early Middle Woodland), as represented in the middle and upper levels at the Vinette site, Pseudo Scallop Shell, Wickham Incised, and Wickham Punctate types appear, signifying still other connections, and definite separation from Hope-

[23] Corded decoration may be equally early in the Upper Great Lakes area, but if so, the evidence has not been published.

[24] Cole and Deuel, 1937, pp. 187–98, 200.

[25] Quimby, 1941, Type II-B pottery, p. 71 and II-D, p. 72.

[26] During the 1948 excavations of the Rochester Museum of Arts and Sciences on East Sugar Island, Rice Lake, Peterborough County. It occurred here in lowest levels of a stratified site, with Point Peninsula Rocker-Stamped and other early forms (Ritchie, 1949, Fig. 5).

[27] Ritchie, 1944, pp. 163–4.

[28] Griffin, 1945, pp. 221–8.

[29] Webb and Snow, 1945.

[30] Ritchie, 1937, pp. 186–7; 1944, p. 187.

Fig. 42. Distribution of the New York pottery types: *top*, Owasco series; *bottom*, Point Peninsula series.

well levels in general. The combination of the former type with rocker-stamped, dentate, and punctated sherds, many of types already identified in our series, has a wide geographical distribution across lower Ontario eastward into the Maritime Provinces and Upper New England, and westward for a still unascertained distance.[31] The Pseudo Scallop Shell and Wickham Incised types seem to be regional variants in the Northeast, while the punctation technique has a much wider distribution.

In the later level of the Vinette site, and in much greater abundance at Jack's Reef and the lower component at Wickham's, innovations appear in the form of Kipp Island Crisscross, Jack's Reef Dentate Collar, Jack's Reef Corded Collar, Jack's Reef Corded, and Point Peninsula Corded Punctate. The latter three, and the earlier Point Peninsula Corded, seem to have generic resemblances to types which, in varying strength, occur in the early Owasco horizon. This raises the crucial question whether continuity or acculturation, or a mixture of both processes, are involved in the picture. The ceramic evidence already adduced, plus the confirmation afforded by the trends in surface finish, in which the corded and smoothed-over corded treatments carry over from one series to the other while the smoothed exterior and channeled interior (Fig. 38, *t*, *v*) treatments show a steady decline (Fig. 43, *bottom*), provide some measure of support for the theory of continuity in the non-pottery linked traits of the two cultures.[32]

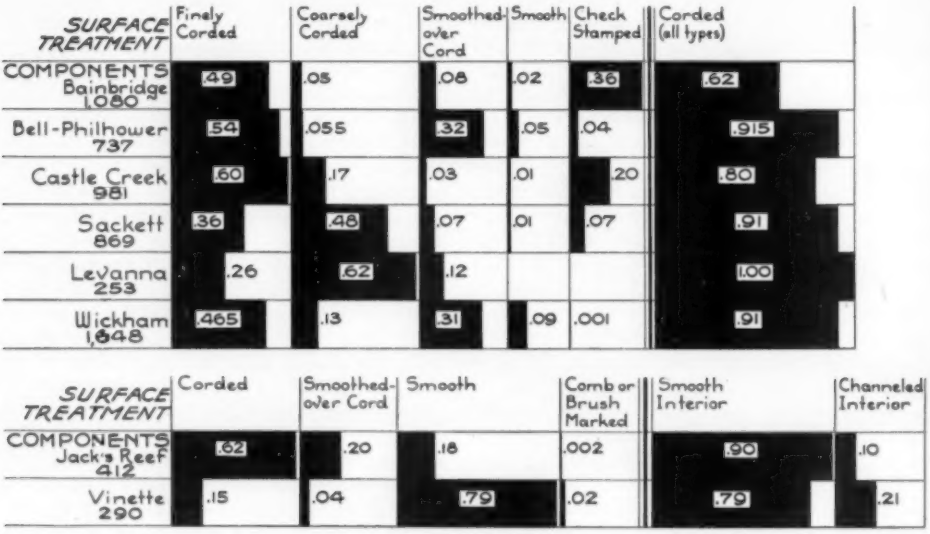

FIG. 43. Distribution of surface treatment on New York pottery: *top*, Owasco series; *bottom*, Point Peninsula series.

Indications against continuity comprise not only the numerous non-ceramic differences, especially in the diagnostic traits of each culture,[33] but the near absence from the Owasco series of the dentate and the total absence of the rocker-stamping techniques, both of which are strongly represented in what we believe to be the later stages of the Point Peninsula at Jack's Reef. Dentate stamping, to be sure, was already on the decline at that time, but the trend in rocker-stamping was still ascendant. Also, the collared types at Jack's Reef, although faintly present at Levanna, are lacking from the presumably earlier Owasco stations of Wickham and Carpenter Brook, and do not

[31] Ritchie, 1946, p. 17.

[32] Ritchie, 1944, p. 52.

[33] Ritchie, 1944, pp. 50, 116–7.

re-emerge in strength until full Owasco times (Sackett site) without, however, the dentate decoration. It should also be pointed out that, while all Point Peninsula collars are appliquéd, early Owasco collars, except for the rare instances at Levanna, are of the channeled type, the appliqué technique not being in evidence until the late Owasco of the Castle Creek Focus. The crisscross decoration of the later Point Peninsula horizon[34] likewise has no parallel in Owasco.

Despite these serious discrepancies, it seems to us that the evidence for continuity with change is somewhat stronger. At the same time we recognize that key elements of the picture are yet lacking and that some other culture complex may somewhere exist which will serve as a better ancestor for the early Owasco.[35]

Within the Owasco seriation, too, we can readily discern some threads of continuity (Fig. 42, *top*). The Owasco Herringbone, Owasco Platted, and Owasco Corded Horizontal characterize the whole aspect. The latter two types increase in frequency until the final phase, while the Herringbone reaches its acme in middle Owasco times. The following are early types which disappear prior to the maturation of Owasco culture: Wickham Corded Punctate, Carpenter Brook Cord-on-Cord, and Levanna Cord-on-Cord, all of which have late Point Peninsula affinities, as already indicated. In the middle or full Owasco period Canandaigua Plain and Levanna Corded Collar appear as minority types, while Owasco Corded Oblique reaches its heydey. Late Horizon types comprise Castle Creek Punctate, Castle Creek Beaded, and Castle Creek Incised Neck, all of which lose their prominence before terminal Owasco times. Owasco Corded Collar and Bainbridge Collared Incised are also late types, but these seem to be ascendant towards the end of the period, while Bainbridge Linear and Bainbridge Notched Lip are types which characterize the terminal phase of the period.

In broad perspective this picture suggests a long process of internal development with certain salient trends in the direction of collared and incised types, a rising incidence of castellations, a tendency toward better levigated and fired paste, and an increase in the frequency of checked-stamp surface treatment (Fig. 43, *top*), all of which bear in the direction of the Iroquoian configuration.[36]

However, it has been shown that incised decoration occurs only on Castle Creek pot necks, not on the rims as in the prevailing Iroquoian parallels for the late Owasco Corded Horizontal, Owasco Herringbone, and Owasco Corded Oblique types. It may be that certain undug sites will provide the missing connections but this still remains an assumption.

The finer sequential site differentiation having been established, insofar as the data permit, we may attempt to apply it to the interpretation of the chronological position of other cultures within the area. Middlesex ceramic remains are quantitatively small, but since all pertain to the Vinette 1 type we conclude that this period antedates or is contemporaneous with the Early Point Peninsula on an Early Woodland horizon, an hypothesis which is sustained by the testimony of the other cultural traits.[37] The New York Hopewellian, in terms both of non-pottery elements and its pottery types, which include Vinette 1, Geneseo Cord-Marked,[38] and Point Peninsula Corded,[39] patently overlaps both the Middlesex and Early Point Peninsula manifestations.

Certain possible areal differentiations, of significance when more data are available, may be hinted at, especially in the Owasco series. For instance, the Levanna Corded Collar type is closer typologically to the Jack's Reef Corded Collar type of the late Point Peninsula, than it is to any of the types which occur in the presumably earlier Owasco, Carpenter Brook, or Wickham horizon. This may conceivably mean that Levanna and Jack's Reef are genetically related, while Carpenter Brook and Wickham's might derive from some other later Point Peninsula manifestation. Another lineage

[34] This type takes its name from Kipp Island, where it is relatively more abundant than elsewhere (Ritchie, 1944, pp. 132–43 and Pl. 58, *8*, *11*).

[35] Ritchie's Canadian material, excavated in 1948 from a stratified site on East Sugar Island in Rice Lake, contains Owascoid sherds and a broad triangular arrowpoint which hint at Middle Woodland Owasco prototypes in this area (Ritchie, 1949, pp. 9, 19–20, Fig. 5).

[36] Numerous non-pottery traits are shared by Owasco and Iroquois cultures (Ritchie, 1944, pp. 41, 46).

[37] Ritchie, 1944, pp. 186–7.

[38] This is very similar in paste and form to the Vinette 1 type, from which it was doubtless derived. The major distinction consists in the absence of interior cording, the inside of the pot having been smoothed. A number of the sherds have smoothed-over cord exterior surfaces.

[39] Known only from a single pot at one site (Ritchie, 1938, p. 134, and Fig. 3).

might include the Wickham and Castle Creek sites, which are linked by the presence on both of the Castle Creek Beaded type. This slender evidence might be interpreted to mean that the Wickham complex is an early ancestor of the Castle Creek, while the Levanna and Sackett components underlie some still undefined late Owasco manifestation. Both the Bell-Philhower and Bainbridge components appear to be derivatives of the Owasco developmental stage revealed at the Castle Creek station, but to represent respectively, different later historic tribal groups. Recent excavations at the Bell-Philhower site lead to the inference that the Munsee possessed the Castle Creek culture on their entry into northern New Jersey from southeastern New York,[40] while the Bainbridge variant, on ceramic grounds, may have developed into the culture of the Mohawk Iroquois.[41] Thus it seems conceivable that we have in the cultural composite designated the Owasco, the tangible products of two discrete linguistic groups, viz., Algonkian and Iroquoian, which bifurcated in southeastern New York state in late prehistoric times. Such an explanation would, in terms of existing evidence, shed light only on the genesis of the Mohawk subdivision of the Iroquois pattern. It is also possible that an exceedingly detailed comparative scrutiny of the sites (providing they can still be found) forming the direct lineages of the Bell-Philhower and Bainbridge components, respectively, might disclose significant differences both in ceramic and non-pottery traits, now obscured by our imperfect picture of the aspect.

The general trends in culture development, just indicated in terms of pottery for the New York area, have parallels in many parts of the eastern and central United States. When other elements of the cultural picture are added to the pottery sequence, e.g., projectile points, the bone constituents, settlement patterns, and mortuary traits, the resemblances are enhanced. In a word, over a very broad geographical range, one finds double-corded pot types, associated with broad stemmed and notched projectile points; the use of native copper tools and ornaments; large bone implements, including the comb; the tubular smoking pipe; bar- and boatstones; tubular and discoidal shell beads, etc., all linked to sizeable settlement sites evidently predicated upon horticulture, and correlated with a remarkable emphasis on mortuary matters. This early period of florescence develops into a brilliant climax, when the cult of the dead stands forth starkly as a pivotal point in the orientation of cultures as far separated as Louisiana and New York. Smooth-bodied pots with over-all or zoned decoration done in dentate, rocker-dentate, or plain rocker-stamp technique, appear over a very wide area, while straight[42] and elbow pipes evolved from tubular prototypes in the Northeast.

This cultural maximum evidently represents the diffusion of an intensely religious institution, centering around the dead, which had come to dominate the value-attitude systems of many widely-separated groups. The paraphernalia everywhere show striking similarities, and comprise such devices as the platform pipe, various forms of the gorget, the use of sheet mica and copper, cut animal jaws and teeth, pearl beads, copper ear spools, conjoined copper tubes, flat copper axes, conch shell containers, flake knives, large corner-notched points, cache blades, etc. Mortuary customs of general distribution include cremation, extended inhumation, the use of burial mounds, and a rich panoply of grave goods. The latter were, evidently, in large part ritualistic in character, since they have few counterparts in the common utilitarian artifacts found in the habitation sites.

This concept of the Hopewellian configuration as a religio-ceremonial phase, analogous to a "church," is somewhat at variance with currently entertained notions. Its development seems to have taken place not in the south,[43] but within the northern United States, for its inception seems already faintly visible on the Archaic horizon.[44]

Until the end of Hopewellian times the eastern United States appears to have been essentially a single "culture area." After its decline, for still unfathomed reasons, the sundry regions encompassed by the Hopewellian tradition began to develop individually along diver-

[40] Ritchie, n.d. *a*.

[41] This subject will be considered by MacNeish in a future paper on the Iroquois.

[42] The straight pipe, in our terminology, differs from the tubular pipe in that the former has a well formed bowl chamber connected with a sharply constricted stem tube, similar to that found in the elbow type, while in the tubular form the bore diminishes gradually.

[43] MacNeish, 1947, p. 12.

[44] Ritchie, 1945, pp. 21–2.

gent paths in the Late Woodland and Early Middle Mississippi periods.

The Northeast witnessed the rise of the Owasco culture, which demonstrates a complete lack of preoccupation with mortuary matters and a total absence of any of the traits of the Hopewellian religious complex. The subsistence pattern is now clearly founded upon maize and bean horticulture, and large, permanent, fortified towns prevail. The ceramic complex, although showing some Point Peninsula features, as pointed out above, is launched upon a distinctive pathway which has already been traced in part.

The earliest post-Hopewellian period in the Midwest is a generalized Woodland manifestation, which is gradually submerged by the diffusion of Middle Mississippi, ultimately to emerge as Upper Mississippi cultures. Diagnostic traits are large river-bottom villages subsisting upon corn raising; truncated pyramid mounds; shell- and grit-tempered pots of globular form with flaring rims and handles; and a new set of mortuary customs marked by inhumation in cemeteries, usually with offerings of pottery, a specific non-Woodland trait.

Generally speaking, the growth of the Middle Mississippi pattern follows upon the decline of the Hopewellian horizon in the Southeast. In the northern part of the area a feeble Woodland is soon supplanted by the vigorous Middle Mississippi manifestation, which ultimately derives from Middle American sources, and is broadly defined by large ceremonial centers with truncated pyramid mounds arranged about a central plaza; wattle and daub house construction; intensive corn horticulture; cemetery inhumations, occasionally with elaborate grave goods; a wide variety of new pottery forms, such as bottles; salt pans; wide-mouthed, globular, handled jars; effigy vessels; and negative painting.

Despite these great regional differences, a number of common traits prevail over the whole eastern area, probably diffused from more than one center. Chief among these are triangular arrowpoints, elbow pipes, incised pottery decoration, globular-bodied pots, a strong emphasis on ceramics and shellwork, and a correspondingly weak use of chipped stone, with an almost complete absence of problematical polished stone forms, like the gorget.

The total impression created by this scrutiny of a large segment of eastern American prehistory, and specifically of the New York sequence, is one of gradual transition from a primitive semi-nomadic culture based upon a subsistence economy, as seen in Archaic and early Woodland periods, to a more urbanized way of life predicated upon horticultural activities which afforded the means for relatively stable residence and the elaboration of cultural devices. A stratified society with a priestly caste seems indicated, as well as the differentiation of artisan groups who gave wide expression to individual creative ideas in a number of media. This broad generalization, we believe, is widely applicable and relates, rather than separates, our area to other culture centers.

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Rochester Museum of Arts and Sciences
Rochester N. Y.

University of Michigan
Ann Arbor, Mich.

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ARCHAEOLOGY OF FAR FAN BEACH, PANAMA CANAL ZONE

DONALD S. MARSHALL

INTRODUCTION

PEABODY Museum, Harvard University, contains two collections of archaeological materials from Far Fan Beach, Panama Canal Zone. The first was given to Mr. Frederick Johnson in 1931 by an army engineer, without any stratigraphic or other data. The collection comprises some ten sherds picked up while excavating a gun position, and correlates exactly with the collection of some thousand specimens obtained by Dr. David B. Stout of Syracuse University during his work with the San Blas Indians in 1941.[1] This second series was discovered in much the same fashion as the first, though fortunately Dr. Stout was able to get to the site while a few pieces remained *in situ*.

Excavation of the site in the midst of war-hastened construction did not permit the detailed work desired by Dr. Stout, but the results are felt to be a step toward piecing together the background of Panamanian archaeology. Present trends of thought see the Isthmus of Panama as the scene of fluctuating migrations of peoples in the past, and an understanding of the archaeology will aid materially in establishing the course of American prehistory. While Dr. Samuel K. Lothrop and others have made an admirable and extensive start in establishing ceramic sequences in the Coclé, Veraguas, and Chiriqui areas of Panama, the writer is aware of only one work at present which deals with the archaeology of Darien. Linné's *Darien in the Past*[2] covers the area in extensive, though necessarily superficial fashion.

LOCATION

Far Fan Beach is at present a bathing and recreation area for Canal Zone employees. Since it is located in the heart of the defended zone and surrounded by gun positions and army posts, future work must be carried out with military sanction. The beach itself is on a small arm of Panama Bay and lies about 500 feet from the former mouth of the Far Fan River, which has now been diverted so that it flows into the bay at a different point (Fig. 44, *A–C*). In addition to recreation buildings,

[1] The writer is indebted to Dr. Stout for the kind permission to use his field notes as well as for permission to publish the results. Dr. Alfred Kidder, II has been of utmost assistance in reading and criticizing the manuscript, as well as in devoting many hours to discussion of the problems at hand. Dr. S. K. Lothrop has graciously allowed the author to read the manuscript of his report on the archeology of Veraguas, now in press.

[2] Linné, 1929.

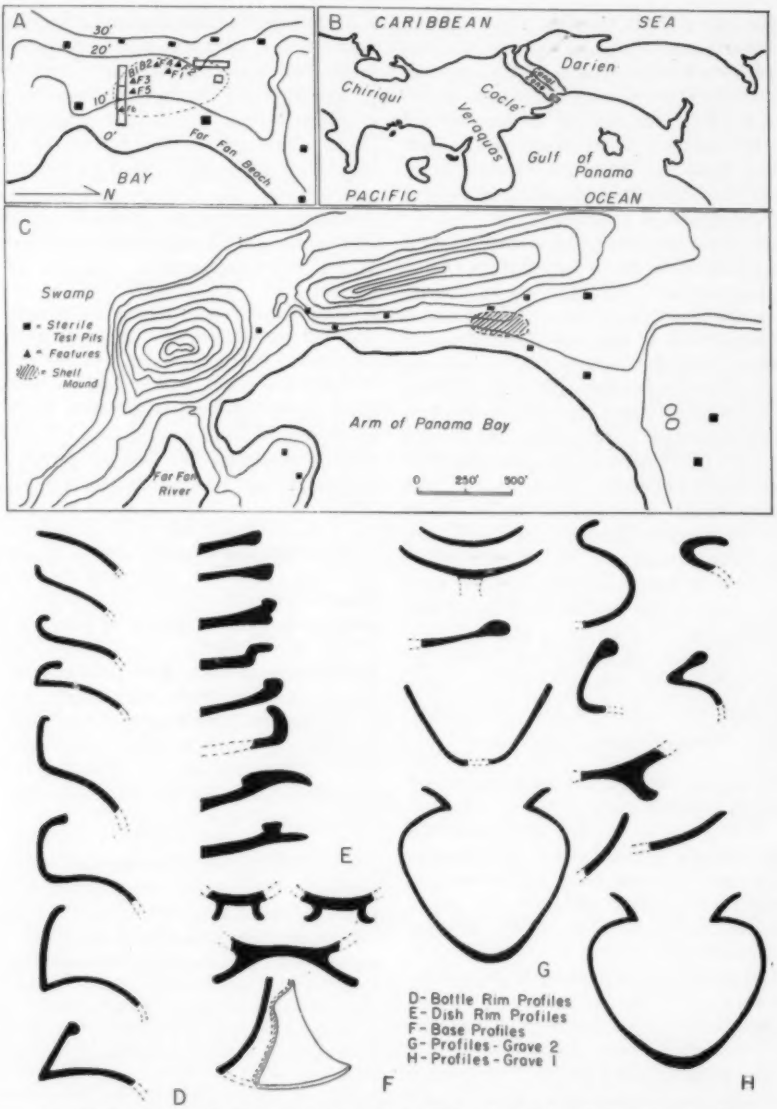

FIG. 44. Far Fan Beach, Panama: *A*, plan of site; *B*, location of site; *C–H*, pottery profiles.

a semi-private rifle range has been cut in the side of a hill. This should be of aid in establishing stratigraphy, as it is situated on the shell midden described below.

Along the west and northwest shores of the bay, extending back about 100 feet from high tide mark, there is a band of shingled shells, which are probably wave deposited, since they stand on edge and are tightly packed. Overlying this band of shells is a layer of black sandy soil, containing tiny fragments of shells and an occasional sherd. This layer extends from the margin of the beach to the top of the hill, where it merges with root-bound top soil that once covered the whole site. At the base of the hill, only several feet above high tide level,

there once lay a shell midden which was in part (the portion nearest the hill) overlain by a layer of brown soil, in turn covered by the black top soil. These brown and black layers appear to have washed down from the hill and covered the shell midden during and since its occupation. A village was able to exist here, only 10 or 15 feet above high tide, because of the sheltered nature of the bay.

The site was discovered while laborers were clearing a large area for the gun range. Both manual digging and machine grading were carried on for some time before Dr. Stout's arrival; thus, most of the site had been dug away and destroyed, only a small portion remaining undisturbed. Dr. and Mrs. Stout, assisted by several laborers, worked for two weeks, continuously hampered by rainy weather. Generally, as fast as a feature was found the grader leveled it off, allowing no time for precise archaeological procedure. Dr. Stout estimates that sherds by the barrel-full were thus lost, although he feels that a fairly representative sample was obtained.

It was impossible to determine whether any of the midden had been formerly exposed. It is likely that none was, all of it being covered by the black and brown soil. The cover of soil was deeper toward the hills than the beach.

SHELL MIDDEN

The midden appeared to have a roughly oval shape and to measure about 300 feet long and 100 feet wide (Fig. 44, *A*). The only parts still remaining, around the southern and western margins, are overlain with soil; they were never more than 2½ feet thick and in some places only 1 foot thick. The midden was undoubtedly a refuse deposit, since it was interspersed with fire-cracked rocks and soil, as well as patches of burnt clay and large quantities of sherds. This formation differs markedly from the wave deposited, shingled shells nearer the beach.

Dr. Stout feels that the midden was similar to the shell middens of Kentucky and Tennessee. The groups of fire-cracked rocks, bits of burned shell, and patches of reddened soil suggest that "fires had been built upon it many times, stones heated in the fire, and shell fish put on the stones to cook in their own moisture." Shell heaps were found by Linné on the Pearl Islands and their distribution and significance are discussed at length in his report.[3]

[3] Linné, 1929, pp. 118–29.

The majority of sherds and all stone artifacts were picked up from disturbed soil. As they were not selected, but were systematically picked up from the surface, they are probably a representative group. It is doubtful that any possible deep graves were reached, if indeed the important personages were buried among the rubbish as the "commoners" were. Five "features," or groups of sherds *in situ*, were recovered, as well as two secondary urn burials.

STRATIGRAPHY

The disturbance of soil by machines and laborers prevented any accurate recording of stratified levels and styles. However, the range of types found in the disturbed soil is almost the same as that found in association in the various features and burials, and this allows the possible conclusion that the site may not have contained any stylistic stratigraphy.

CERAMICS

No attempt has been made to classify the Far Fan ceramics according to wares. The sherds available constitute much too small a proportion of those known to have been present at the site to warrant this type of treatment, particularly in view of the lack of stratigraphic information. It is felt that a brief description of the material and a comparison of some of its outstanding characteristics with those in other sites of the area should serve the purpose of recording the material for future use.

SHAPES

The shapes of Far Fan pottery fall into three distinct types which are extremely variable and tend to run in a continuous range:

1. *Dishes.* These are defined as vessels wider than they are high which were obviously not intended as containers for liquid. They were found in comparatively large quantities at the site, and may be plain, rounded, or have either a decorated ring base or a plain or effigy pedestal stand. Their diameter generally runs from 6 to 10 inches, their depth from about 1 to 1½ inches, and their thickness from ¼ to ⅜ inch. Their material is more likely to conform to a standard type than in the case of the other forms; they generally have a hard, sand tempered, red paste, showing red paint on the rim with the inside polished and/or slipped or painted red. Plates may have a smooth, even rim; a "drooped" rim; or any one of the variety of raised edges shown in Figure 45, *E*. Shallow dishes are apparently not a widespread trait in Central and South America, being found in quantity mainly in the Coclé and Darien areas.

2. *Bowls.* These are open mouthed vessels, wider than they are high, and obviously usable as containers for liquids. They vary in shape from simple rounded vessels

to those having a shallow, flaring, double flanged rim with incisions and painting (Fig. 45, *13*). Bowls are generally composed of a variation of the red or brown paste, and may be crude hand modeled pieces (Fig. 45, *12*) or the graceful forms exemplified by Figure 45, *13*. Absolutely no trace of tripod legs was found, though these occur in abundance in Chiriquí and Veraguas, and to a somewhat lesser extent in Coclé and on the Pearl Islands.

3. *Bottles*. These are predominant over all other types and are extremely diverse as to size, shape, and material. They are defined as vessels with a diameter equal to or less than the height and with a comparatively narrow opening. The neck may be a simple opening in the vessel, but is more generally some form of lip that ranges from a simple roll to an elaborate and gracefully shaped carafe-type neck (Fig. 44, *D*). Sherds indicate that a range of coarse to fine material was used, as well as several degrees of surface finish, including polychrome. Sizes range from miniature bottles 4 to 5 inches in diameter to large 18-inch burial urns with bottoms 1½ inches thick. Necks and rims of all shapes and types are generally painted red.

The bases of vessels range from the somewhat pointed ends of the burial urns, which do not allow them to stand upright, to flattened, rounded bottoms. There are also several types of ring and pedestal bases (Fig. 44, *F*).

CONSTRUCTION

Construction was in some cases by crude hand moulding (Fig. 45, *12*), but generally by coiling. If not an integral part of the object, bases were applied to the vessel after the surface had been roughened by punctures, as in Figure 45, *18*. Surfaces were first finished roughly, perhaps with a corn cob as in Figure 45, *17*, and then in most cases by various degrees of smoothing with sticks and/or stone tools, marks of which are obvious on many sherds. The clay itself is of great variety, firing to many shades of white, tan, and red. The slip varies from an almost transparent "wash" or "float" to a thickly encrusted sheathing. Color and material may be the same or different. In almost all cases, lips are painted red, and the interiors of plates and bowls polished and/or slipped red. The thickness of the sherds ranges from ⅛ to 1⅛ inches.

DECORATION

The techniques of decoration include modeling, incision, and appliqué work with reeds, or other types of punctation and incision. Pointed nodal lips and double rims also serve as elements of decoration. Incision is generally naturalistic rather than geometric, and often serves as an outline for red and black paint.

Degeneration of surface has progressed so far as to prevent complete description of the decoration, for weathering has left at most a few traces of paint or slip on the largest percentage of the material. Nevertheless, polychrome painting is definitely represented by several sherds. There are two distinct styles, as exemplified by Figure 45, *5* and *1*. No. 5 has black and red lines on a white paste, whereas No. 1 has black and dark red on white paint over a red paste. Several sherds of a third painted ware are of a distinctive nature, in which the exterior of the grey paste has turned bright orange upon firing. These were too badly weathered to distinguish colors other than white with certainty. Most polychrome ware appears to be from plates or bowls, but one sherd of a large, everted lip bottle has black and dark red on white paint on red paste.

TEMPER

Temper is generally of sand, although many sherds have inclusions of crushed sherds, or crushed shell, or a mixture of two or all three of these. Firing was in many cases uneven, producing red, black, and tan colors in the same sherd.

USE

While the burial urns themselves show no signs of use, many of the other vessels have a thick incrustation of carbonized material, suggesting that production was for domestic use rather than as intentional grave furniture. Utility is further suggested by the plainness of most vessels, in contrast to the few exotic polychrome specimens and effigy jars.

ITEMS FROM THE DISTURBED SOIL

The following specimens from the disturbed soil are illustrated:

Figure 45, *10* represents a distinct type of sherd found in both collections. The combination of incision outlining red paint, punctation in the non-painted area, and red painted lip, occurs on many sherds. Linné[4] found much the same thing in the Pearl Islands. While the hole in the rim may be a means of suspension, it is probably evidence of "crack lacing," discussed at length by Linné in his *Techniques of South American Ceramics*.[5] The only handle found at the site is rounded in cross section.

Figure 45, *7* illustrates a fragment of an effigy pedestal base. The hole is punched through the former interior of the vessel into the hollow foot, the interior surface still showing smoothness and possible traces of paint.

Figure 45, *6* shows a section of a pedestal foot similar to that illustrated as No. 2, the arrow indicating paint re-

[4] Linné, 1929, p. 135.

[5] Linné, 1925.

mains. Linné[6] found similar pedestal remains in Darien.

In Figure 45, *15* is a type of incision on an effigy foot which is also found at Coclé and Darien.

Figure 45, *9* shows an effigy-bottle neck sherd which has traces of orange paint. This type of effigy neck is common to the entire North and South American area.

Figure 45, *13* represents an exceedingly graceful type of shallow-bowl sherd with a double flanged rim painted red, a red-painted interior, and incision on the exterior outlining black painted designs. There are traces of red paint at the base of the exterior surface.

FEATURES

Feature 1. A group of sherds were found 2½ feet below the grass line (the top 12 inches consisted of black soil, the rest of brown) in a shell lense just above the yellow sub-soil. Partially carried away by the grader, the remains include:

a) The side and shoulder of a large bottle of crumbly brown, earthy paste incised with a parrot design (Fig. 45, *11*). The surface is smoothed, possibly slipped, and has tendency to scale. The inside is either unfinished or completely scaled. Sand tempered, with a black carbonized fire "bloom," the vessel is at least 18 inches in diameter.

b) Some sherds are from a small bowl of the same type paste, but fired to a harder consistency. The exterior is stone polished, the interior surface smoothed, but it scales as above.

c) There are also sherds of red paste with a thick layer of carbonized material inside and the outside slipped.

d) Miscellaneous sherds are of a grey paste which fires orange. They show traces of white paint.

Feature 2. Sherds of eight or nine vessels were found 1 foot below the grass line. None is certain as to shape. Although disturbed by the grader, they appear to be an accidental association of fragments.

a) Two sherds are of the light buff or white material with crushed sherd inclusions, traces of paint, and smoothed surface. These are probably of the ware having red and black paint on white paste.

b) Many sherds are of red paste with inclusions of crushed sherds and sand. They are of various thicknesses. Some have carbonized matter inside. Other harder sherds with sand inclusions have traces of a thin slip and fire "blooms."

c) A large sherd comes from a thick-walled tan bowl with a red slip or wash inside and a stone-polished exterior.

d) There were several rim sherds of bottles, one from a bowl, and one from a dish with a red rim.

Feature 3. Three feet east of Burial 1, at the juncture of the shell and black soil, 1.9 feet deep, and in association with burned shell, were found *in situ* a small bottle and an effigy vessel:

a) The bottle (Fig. 45, *19*) is 4 inches in diameter and has a concave bottom. It is decorated with an appliqued fillet with reed punctures on either side in the form of eyebrows or a stylized turtle, and the outrolled rim is painted red. Material is red clay with sand temper, and there is a float or slip on the smoothed surface.

b) The effigy vessel, measuring 3 by 5 inches, appears to be a monkey in a crouching position. It is of greyish tan paste with sand temper, and has a soft textured, thin red wash (Fig. 45, *16*).

The bottle has a hole, and the effigy vessel is missing its head and tail, none of which was found in the associated soil. There was no evidence of a pit, and so both can be assumed to be rubbish rather than grave objects.

Feature 4. Some 1.5 feet below the surface in brown soil, crushed, and mainly carried away by the scraper, were the sherds of three vessels:

a) A reddish brown vessel with sand and crushed sherd inclusions, ¼ inch thick, with carbonized deposits on the interior and a smoothed exterior.

b) A large red vessel with sand and crushed sherd inclusions, smoothed interior and exterior, ⅜ inch thick.

c) An earthy, dark brown vessel, smoothed and slipped on the exterior, with large inclusions of a white material (crushed shell or bone) showing clearly in the smoothed surface. This appears to have been a simple bowl with walls about ⅜ inch thick.

Feature 5. Disturbed by the grader and found about 2.5 feet below the grass line at the juncture of the black soil and yellow sub-soil, were fragments of at least five vessels:

a) A portion of a large vessel resembling the burial urns. It had a badly burned bottom, containing a black carbonized material. The neck was about 6 inches in diameter and showed coil construction; the body, about 13 inches in diameter, ⅜ inch thick, smoothed, slipped, and brownish in color. No trace of bone was found, and so it is assumed that this was a cooking vessel.

b) Rim sherd of a plate with raised edge of a hard red material and sand temper.

c) Large rim sherd of a crudely hand moulded plate with the rim 1¼ inches wide. The paste is greyish but has a red exterior color from firing and traces of slip or paint. The thickness is ¼ inch; the depth, from 2 to 3 inches.

d) Plate sherd of the same grey material, which fires red. The diameter is about 10 inches and the depth, 2 inches. There is a beaded rim. Traces of paint or a thick slip are also present.

e) A portion of the neck of a reddish bottle.

Feature 6. This consisted of a layer of fire-cracked rocks at the juncture of the black soil and the shell, about 1.25 feet deep. The rocks appeared to be vesicular lava and there was nothing beneath the rock layer but shell.

[6] Linné, 1929, p. 83.

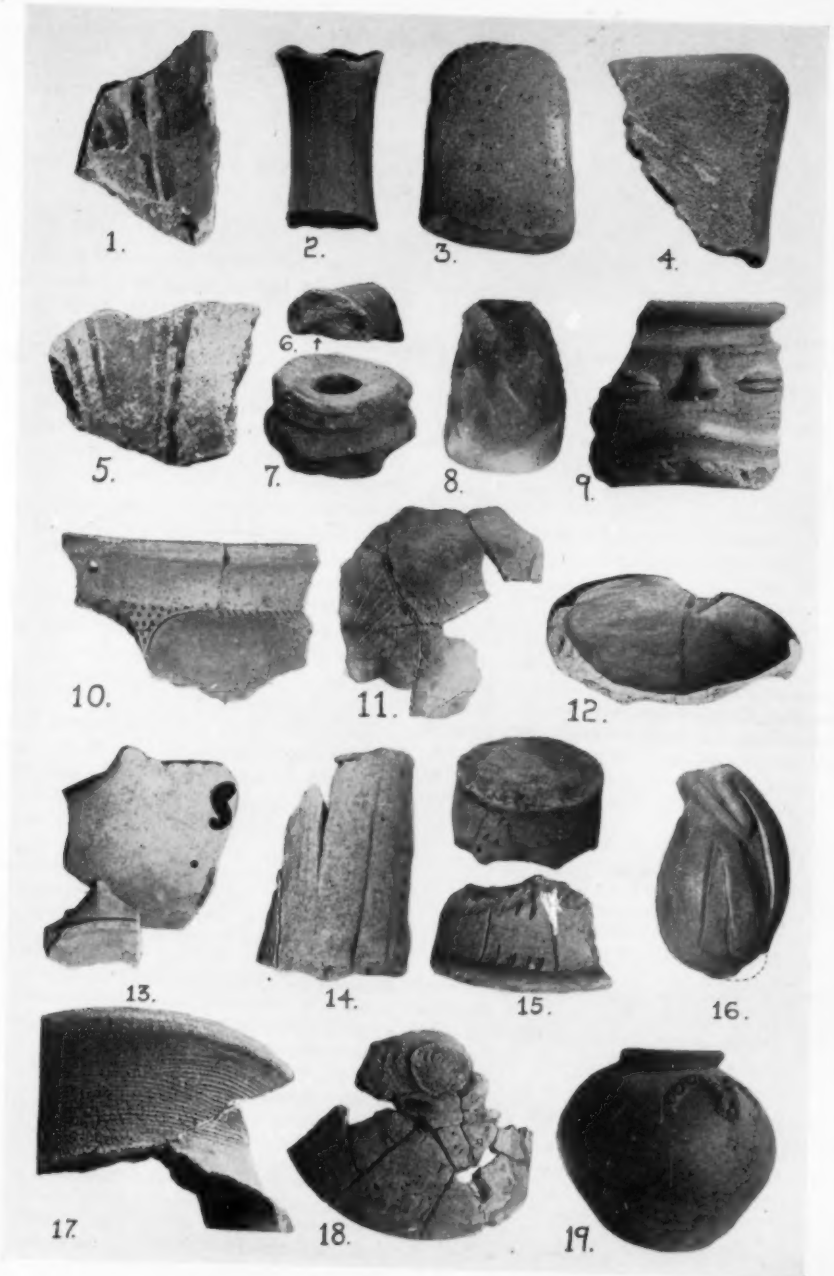

FIG. 45. Artifacts from the Far Fan beach site, Panama.

BURIALS

Burial 1. The urn of this burial was disturbed by the grader and removed from the hole as a chunk of soil with adhering earth. The workmen set it on a box, where it collapsed before Dr. Stout's arrival. The hole it came from was about 1.5 feet deep, and the associated sherds were primarily in the soil inside the vessel, though, as some came from soil in the hole, there is a possibility that all may not be in true association (Fig. 44, *H*). No trace of bone was found. The following is a list of the artifacts:

a) The burial urn itself. It had the typical red-painted rim and was of greyish tan, hard-baked ware. There were sand and crushed shell inclusions, the inside was not carbonized, and the outside rim had been given "corncob"-finish striations. The walls were smoothed inside and out. The diameter and height measured about 18 inches; the bottom was 1 inch thick, the side 5/16 inch, and the rim ¼ inch.

b) A small bottle with mouth 6 inches wide. It was of brown paste with sand inclusions and traces of a red slip or wash. The inside is marked with grooves left by the burnishing tool.

c) Rim sherds of a large bottle, having a brown paste and sand inclusions. The neck is 5 inches high.

d) Rim sherds of another large bottle with everted lip.

e) Rim sherds of an orange brown bottle with traces of red paint on the rim.

f) Small sherd of white-painted red ware.

g) Small sherd of a thin brown bottle, hard and well smoothed outside, blackened inside.

h) Sherd of a ring base of hard red ware, 4 inches in diameter. The inside shows traces of fine finish; there is crushed sherd temper.

i) Two large sherds of a deep, flaring bowl with red slip inside.

j) Sherd of a shallow plate with red-painted rim. There are thin sand inclusion, the ware is red, and the sherd has a red slip inside.

k) Miscellaneous unidentified sherds.

Burial 2. This was found under same circumstances as Burial 1. The depth of the hole was 2 feet, and so the top of the urn was only ½ foot below the surface in black and brown soil. Two fragments of a femur and all the associated sherds and vessels were in the soil inside the urn (Fig. 44, *G*).

a) The burial urn appears to have been unused for cooking. It is of a red ware with sand inclusions. The neck has a diameter of 18 inches and is 16 inches high. The rim is painted red and there are traces of a red slip or wash. The side and bottom measure ⅜ inch thick; the rim, ½ inch.

b) A simple plate of red ware with sand inclusions and traces of red slip, about 7 inches in diameter and 1¾ inches deep. The bottom is ⅜ inch thick and the rim, ¼ inch.

c) The same type of plate as (*b*), but set on a pedestal foot (missing). The diameter is about 10 inches; the depth, 2 inches. The thickness is the same as that of (*b*), and there are traces of red and white paint.

d) A large flaring bowl with red paint on the rim and traces of a fine slip. This vessel was about 12½ inches wide and 5½ inches high. An even hole in the base suggests "killing."

STONE ARTIFACTS

Though no stone artifacts were found *in situ*, seven were picked up in disturbed soil. Two large and one small rounded granitic stones with polished surfaces appear to be manos. There is also a fragmentary rectangular mano of the same material, well worn and polished (Fig. 45, *3*).[7] An irregular rock with an apparently man-made depression is believed to have served as a sharpening stone. A single small, black porphoritic stone celt had a well sharpened and smoothed edge, with a crudely chipped tang of triangular shape (Fig. 45, *8*). Celts of this size and shape are found in Darien, Coclé, and Chiriqui.[8] A broken triangular, man-shaped piece of volcanic stone appears to be well fire baked and may have been part of a comale (Fig. 45, *4*).

SHELLS

Dr. W. J. Clench of the Museum of Comparative Zoology, Harvard University, identifies the shells found at the site as common edible Panamian types *Strombus Granulatus* (conch) and *Pecten* sp. (scallop).

[7] Round and rectangular manos are found in association at Chiriquí and other sites throughout Panama. The writer feels that an investigation as to the uses of the various types of manos and metates would serve to give information as to the food and habits of the people using them. Speculation suggests that the presence of two types of manos in association, both types obviously well used, would indicate a diet of at least two varied types of vegetable or grain foods.

[8] The presence of a single small celt brings to mind one of the perplexing features of Panamanian (and indeed some other Central and South American) archaeology. That is, in obviously heavily forested areas which give evidence in the form of manos and metates that agriculture was practiced, what manner of land clearing was performed? The single small celt found at Far Fan appears to be too small for work of this nature. Whether it is simply a matter of not yet having run across the artifacts used, or whether a technique as yet unknown to us was practiced, makes this an interesting problem for future speculation and investigation.

OTHER CANAL ZONE SITES

Other sites in the Canal Zone have been reported, one along the banks of the Far Fan River and another on Ancon Hill. However as these are in restricted areas, no more information is available. Anyone intending to do work in this region would do well to talk with engineers and with the police officers who supervise the work of convict laborers. Dr. Stout notes that they have supposedly run into sites all over the Canal Zone and can lead one directly to them. In the Museum of the Administration Building in Balboa there is a secondary urn burial from Ancon Hill, containing bones accompanyied by a bowl. There is also an empty urn from Madden Lake, found during construction work.

CONJECTURE AND CORRELATION

The site apparently was a village location with secondary urn burial within the area. The shell midden eventually became covered with soils from the adjacent hill and, as these soils accumulated, the inhabitants continued to live there, made burials, and discarded sherds on the ground, as is shown by the large percentage of weathered sherds. All indications point to a single uninterrupted occupation, the variance in soil color being due to leaching rather than to the accumulation of different soils.

The presence of only a few sherds of polychrome ware might at first lead one to the conclusion that it was a trade ware, but I do not feel that this necessarily follows. Since no deep burials were discovered, and since at Coclé Lothrop found that polychrome ware was exclusively associated with ceremonial burials of high ranking personages and plain ware exclusively with refuse beds, I do not believe that any conclusion may be drawn until deep graves are found in the area. While the few definite polychrome sherds at first appear to be exotic, close examination of sherds reveals traces of painted surface treatment in a large percentage of cases, though most are too badly weathered to know exactly what treatment was given.

There is no way of determining the age of the site or the length of occupation. Certain pottery styles resemble early Coclé phases, tentatively put by Lothrop at 1300–1400 A.D., but it cannot be assumed on the basis of present scanty evidence that the Far Fan Beach site is of the same period, although this seems the most likely hypothesis. As no European artifacts or indication of influence were found, and as we know this area was early occupied by the Spanish conquerors, we may assume at least a pre-colonial dating. The presence of manos indicates a certain amount of agriculture, and the large quantity of shell presumes that shell-fish were a part of the diet. At first glance the ceramic remains indicate a rather simple culture, but the presence of obviously well made and finely decorated polychrome ware, as well as effigy vessels, points either to a trade relationship with the Coclé area or to a more elaborate culture than is apparent from the present artifacts.

DARIEN ARCHAEOLOGY IN GENERAL

In his Coclé report Lothrop suggests on the basis of historical accounts that there was a somewhat homogeneous native culture in the Coclé and Darien areas. Linné's finds in Darien and on the Pearl Islands (particularly on the islands, where Coclé type polychrome pottery proved to be indigenous), coupled with reports of Coclé type pottery at Chepo, 25 miles northeast of the Far Fan site, and at the various other sites discussed by Lothrop in his Cocklé report, tend to confirm this suggestion. Preliminary press reports of the 1948 expedition of the National Geographic Society-Smithsonian Institution to Parita, 160 miles southwest of the Canal Zone also indicate the occurrence of Coclé type pottery, as well as secondary urn burial.

Early reports of Darien, particularly those of the expedition of Vasco Nuñez de Balboa as reported in Anghiera's *De Orbe Novo*, give the impression that the Darien area was far more thickly populated than at present. A relatively high state of culture is suggested by Balboa's reports of houses with stone foundations and of intercourse between the many tribes in the area, indicating social stratification and other complexities. The widespread Panamanian stratification of rank and consequent difference in burial treatment gives hope that eventually graves of the village dignitaries will be found in the Far Fan area and that the grave furniture will give more evidence than the present collection of simple clay artifacts.

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Harvard College
Cambridge, Mass.
October, 1948

AN ARCHAEOLOGICAL SURVEY OF THE BLOWOUTS OF YUMA COUNTY, COLORADO

PAUL H. GEBHARD

EVER since Yuma points were recognized as being particularly ancient, Yuma County, Colorado has been a logical area of interest. Nevertheless, until 1941 the county had received scant attention from professional archaeologists, with the sole exception of a partial surface survey by Dr. E. B. Renaud.[1] On the other hand, there had been considerable collecting by local residents, most particularly by Perry and Harold Andersen of Yuma, Colorado, who have amassed a large and valuable collection including numerous Folsom and Yuma points.

In 1941 Yuma County was still liberally spotted with blowouts resulting from wind erosion of the sandy soil consequent upon the previous drought. Conditions were, for the archaeologist, optimal. Thanks to Dr. Donald Scott, who arranged that expenses be defrayed by the Peabody Museum of Harvard University, my wife and I were enabled to spend part of the summer and early fall in Yuma County and adjacent portions of other counties.

The war prevented the contemplated second field trip. Present circumstances are such that it is highly improbable that we can resume our work in Yuma County. We feel, therefore, that the results of this one season should be published without further delay.

GENERAL DESCRIPTION

Between June 11 and October 4, 1941 we were able to work a total of 50 days in the field, during which time we were primarily concerned with an area of roughly 900 square miles representing approximately two-thirds of the part of Yuma County containing blowouts in quantity. A total of 35 blowouts, or groups of blowouts, productive of artifacts were investigated, 31 being in Yuma County, one in Washington County, and three in Kit Carson County.

In the latter part of the season we were visited by Dr. Harold Smith of the Department of Geology of the University of Kansas. We are indebted to Dr. Smith for a better comprehension of the geology of the area as well as for his pleasant companionship and active interest.

[1] Renaud, 1931, 1932.

The blowouts were located through the use of county maps and the aerial mosaics published by the United States Department of Agriculture, and through information supplied by local residents. They were traversed on foot from one end to the other, my wife and I walking at a fixed interval apart and keeping, insofar as possible, straight and parallel courses. A reasonably productive blowout of roughly one-half mile in length and one-quarter mile in width would require two full days of traversing. All blowouts productive of artifacts were roughly mapped and their position within a section recorded. In a number of blowouts excavations were made to determine more of the stratigraphy; these consisted of small pits and trenches, or the shearing off of the faces of monadnocks to obtain clear profiles.

The blowouts may be divided into three categories:

1. *Primary.* These were large (as much as one mile in length and one-half mile in width), relatively shallow, and often deep enough to expose harder deposits, which were eroded to form small hummocks, monadnocks, and rivulets. A primary blowout often consisted of several connected basins. Two varieties were noted:

a) Areal. Basin-shaped or amorphous.

b) Linear. Elongate basin-shaped, or consisting of several connected basins with their longitudinal axes parallel.

2. *Secondary.* These were smaller blowouts occurring on or amidst older fixed sand dunes. These were relatively deeper than the primary blowouts and had steeper sides, but almost without exception revealed only sterile sand beneath the topsoil.

3. *Artificial.* Superficial blowouts resulting from improper cultivation of fields, or from a concentration of cattle, as about a windmill tank.

Only the primary blowouts were archaeologically significant; the others were almost always sterile and consisted only of sand, or sand with sporadic inclusions of old soil zones.

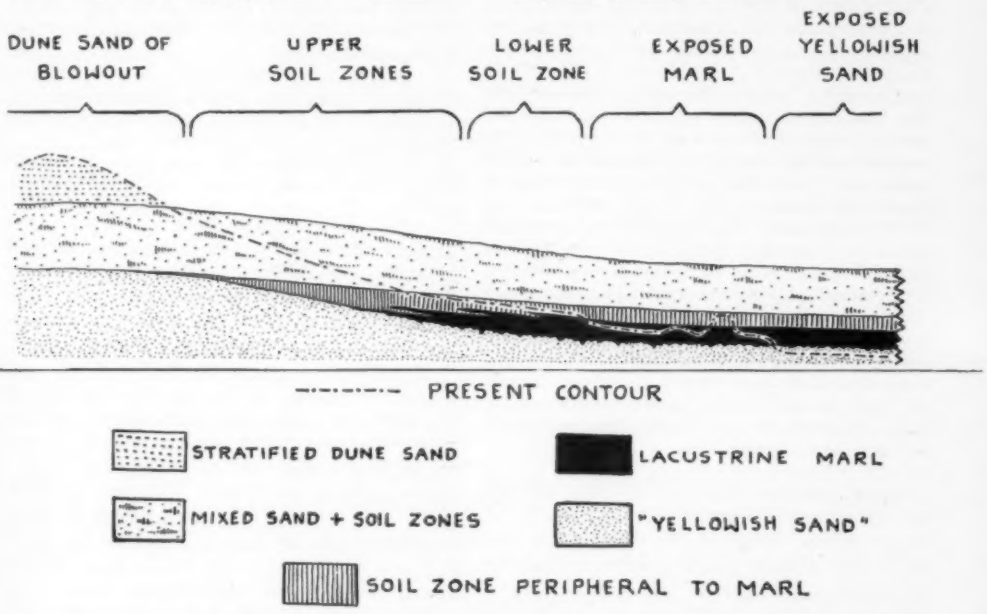

FIG. 46. Half cross section of blowout with marl, Yuma County, Colorado.

Some of the primary blowouts revealed in their deepest portions a lacustrine marl, beneath which lay a reasonably compact to definitely compact sand which I term "yellowish sand" in contradistinction to the sands above the lacustrine stratum. Other primary blowouts lacked the lacustrine stratum and revealed at their deepest portions the "yellowish sand" alone.

Due to the natural exposures offered by the erosion and through our own excavation, we were able to obtain a reasonably clear idea as

to the stratigraphy of the blowouts (Fig. 46). The strata were always in the following order, from top to bottom:

1. Sandy loam, the present topsoil.
2. Stratified wind-born sand, the sand deposited around the blowout periphery, the zone of immediate inflation.
3. Soil zones alternating with sand. These were darker deposits of moderate compactness and varying thickness, ranging from almost black to light brown in color. Sometimes sporadic darker small inclusions, apparently carbonized vegetal remains, were noted. The soil zones adjacent to the lacustrine marl contained some mollusk shells.
4. Lacustrine marl. This was a compact deposit ranging in color from light grey to darker blue grey. It becomes lighter in color and tougher upon exposure, the uppermost few inches hardening into a tough crust defying a shovel, while beneath it is much softer and a darker grey. The marl contains mollusk shells, calcareous nodules and root holes, calcareous webbing, and old mud-cracks filled with calcareous material. The greatest thickness of marl discovered was 3 feet. The calcareous material sometimes intrudes a few inches into the underlying stratum.
5. "Yellowish sand." The contact surface between this and the marl was irregular. Ordinarily the two strata were distinct, but sometimes they graded into one another. The "yellowish sand" ranged in color from light tan to olive drab to rusty orange yellow, the color being primarily derived from small dark orange nodules of some iron compound. The degree of compactness varied, but in one blowout this sand was in the form of numerous laminae each about one-third of an inch thick compressed together to form a hard homogenous deposit. Occasional streaks and inclusions of soil were noted.

In none of the blowouts was any stratum exposed below the "yellowish sand." However, in one blowout (Blowout W) a pit driven into the deepest portion of the blowout revealed a variable layer of marl (3 inches to 1 foot in thickness); about 1½ feet of the "yellowish sand"; a 6-inch stratum of somewhat darker olive sand; and then a pinkish sand of somewhat coarser texture. Previous investigations in a gravel pit, approximately 20 feet deep, lead me to believe that this pinkish sand stratum is quite thick. The gravel pit revealed the following strata:

1. Sand covered by a thin topsoil: 3 feet.
2. Soil zone with a mixture of clay: 1 foot. This may correspond to the marl.
3. Sand: 4 feet.
4. Pink sand, somewhat coarser: 1 foot.
5. Pink sand and gravel containing concretions: quite compact. This stratum extended the remainder of the pit depth and was the source of the road-building material.

It is interesting to note that the Yuma stratum at the Finley site contained calcareous material and some lacustrine clay deposits, and that beneath this was an indurated greenish sand.[2] We suspect that these strata correspond to our marl and "yellowish sand."

Judging by the stratigraphy one may with some assurance reconstruct the history of the blowouts containing marl:

1. A depression in a sandy plain with a thin topsoil cover.
2. Due to increased humidity a shallow lake forms and lacustrine marl is deposited. Peripheral vegetation creates marked soil zones about the shores.
3. The lake fluctuates in size and the marl and soil zones correspondingly retreat and advance, alternately overlaying one another.
4. The lake dries up eventually and is covered over by the soil zone which has been following the shrinking.
5. The previous deposits are buried by sand and less conspicuous soil zones and inclusions of soil.
6. Wind erosion removes the upper strata to reveal the harder marl, or if marl is absent, the harder "yellowish sand."

This sequence, naturally very simplified, seemed basically reasonable to Dr. Harold Smith who examined a number of the blowouts with us and who had previously arrived at a similar theory based on his studies in Kansas.

Mr. Perry Andersen stated that Yuma and Folsom points were to be found *in situ* only in the marl, and that the marl also contained mammoth and other extinct fauna. Local residents informed me that "elephant tusks" had been found in the marl. We often observed small bone fragments and fragments of teeth weathering out of the marl, but intact teeth and bones were rare. The bones were almost always heavily mineralized and often iron stained. The relatively few intact bones and teeth which we collected proved to be bison of unspecified species.

Dr. Smith and I collected samples of the mollusks from the marl of three of the major blowouts, and these were kindly identified by Dr. Byron Leonard of the University of Kansas. The list is as follows:

Lymnea stagnalis appressa (Say)
Lymnea reflexa (Say)
Lymnea palustris (Muller)
Lymnea parva (Lea)
Lymnea exilis (Lea)
Helisoma antrosa (Conrad)
Helisoma trivalis (Say)
Helisoma campanulata (Say)

[2] Howard, 1943.

Physa gyrina (Say)
Aplexa hypnorum (Linné)
Gyraulus parvus (Say)
Sphaerium sp. pelecypod. At least two species.
Pisidium sp. At least two species.
Valvata tricarinata (Say)
Succinea grosvenori (Lea)
Discus corkhitei anthonyi (Pilsbry)
Menetus exacuous (Say)

All of these mollusks existed in the Pleistocene and also, unfortunately, up to the present time, although not necessarily in present-day Yuma County. Of the species, two are of special interest. *Lymnea stagnalis* requires permanent water, as it cannot aestivate in mud during drought. Consequently the lakes causing the marl cannot have been ephemeral. *Menetus exacuous* is a woodland snail living near water, and hence suggests that Yuma County was thinly forested—at least around the lakes.

THE SITES

Only those blowouts of particular interest will be considered in this listing. The blowouts were named alphabetically from A to Z; when this alphabet was exhausted we employed the Greek alphabet from Alpha to Theta (omitting Zeta for fear of confusion). Closely adjacent blowouts were given the same letter and distinguished by the addition of numerals.

B-1. East central Section 23 T4N R43W. Two connected blowouts, one *circa* one-quarter mile long and 250 yards maximum width; the other shorter but equally wide. Longitudinal axis 30° west of north. Eroded down to marl. Maximum depth estimated at 20 feet. Thirty-seven artifacts exclusive of sherds were found.

C. Central and somewhat northeastern Section 19 T3N R43W. *Circa* ½ mile long by ¼ mile wide. Maximum depth about 10 feet. Eroded to marl. NW-SE longitudinal axis. Thirty-five artifacts found. Mollusk sample taken.

D. South central Section 21 T3N R43W. *Circa* ½ mile long and ¼ mile wide. Longitudinal axis 52° west of north. Small amount of marl exposed at deepest portion. Ten artifacts found. Mollusk sample taken.

E. West central Section 27 T3N R43W. *Circa* ½ mile long and 400 yards maximum width. Longitudinal axis 42° west of north. Eroded to marl and, in small areas, to the "yellowish sand." Sixty-two artifacts and one sherd found. Mollusk sample taken.

F. Eastern Section 26 T3N R43W. Two semi-connected blowouts. The northern one was amorphous and perhaps ½ mile in diameter and shallow. The southern had a NW-SE longitudinal axis and was approximately 1 mile long and ½ mile at maximum width. Maximum depth estimated as 15 feet. Eroded to marl and "yellowish sand." Forty-eight artifacts exclusive of sherds found.

L. Section 19 T2S R46W. One mile long by about ½ mile wide. Maximum depth *circa* 12 feet. NW-SE longitudinal axis. Eroded to marl and locally to "yellowish sand" Thirty-seven artifacts found.

R. Southeast Section 21 T1S R46W. A blowout of "moderate" size (meaning less than 1 mile and more than ½ mile maximum dimension). Eroded to "yellowish sand." Marl stratum absent. Eleven artifacts found.

T. Eastern portions of Sections 29 and 32 T1S R46W. A narrow blowout perhaps 1 mile long with a maximum depth of about 20 feet. NW-SE longitudinal axis. Eroded to "yellowish sand." Marl stratum absent. Six artifacts found.

U. Sections 8 and 9 T1S R47W. A "large" unusually deep blowout eroded to "yellowish sand" and lacking the marl except for a few traces. Eleven artifacts found.

Z-1. Northwestern Section 23 T2S R46W. A blowout of "moderate" size with a NW-SE longitudinal axis. Eroded to marl and "yellowish sand." Eleven artifacts found.

Z-2. Several hundred feet west of Z-1. A smaller basin with a vague NW-SE axis eroded to marl and "yellowish sand." A relatively large marl area was exposed in proportion to the size of the blowout, and this was one of the few blowouts which had not been "picked over" within recent years by collectors. Seven artifacts were found, all in the central portion of the exposed marl area.

Beta. Northwestern Section 35 T1S R47W. A large and amorphous blowout at least one mile long. Eroded to marl and "yellowish sand." Seven artifacts found.

Epsilon. Northern Section 6 T7S R45W in Kit Carson County. About 1 mile long and ½ mile wide. Contained many large monadnocks. Maximum depth estimated at 20 feet. NW-SE longitudinal axis. The stratigraphy differed somewhat from that in the Yuma County blowouts: (1) topsoil; (2) brownish sandy soft soil tending to weather grey; (3) a harder thinner stratum, sometimes slightly marly and with rare shells, but not the usual marl stratum; (4) "yellowish sand." Seventeen artifacts found.

THE ARTIFACTS

In a surface survey of this type, where both ancient and relatively recent artifacts are to be found, one must be on guard to prevent typological considerations from coloring such stratigraphic data as exist. This is particularly true in the present case, where only a few specimens were found *in situ*. Consequently I shall attempt to sharply divide fact from hypothesis.

Fact 1. Certain typologically non-Folsom and non-Yuma artifacts were found in and upon the upper soil zones and sands above the soil zones, often associated with broken burned rocks, charcoal, manos, metate fragments, and sherds. Such artifacts only very rarely were found upon (never in) the grey marl or "yellowish sand." Such artifacts were also found in blowouts wherein the marl and "yellowish sand" were not exposed. Some of the artifacts are similar or virtually identical to artifacts

known to be relatively recent. The associated fauna included *Bison bison*.

Hypothesis 1. Such artifacts represent relatively recent occupation. Those found lying upon the marl or "yellowish sand" were either washed or dropped there as the strata above the marl eroded away beneath them.

Fact 2. Yuma points and points typologically related to Yuma points were found in and upon the marl and in the lower soil zones adjacent to the marl. Two Yuma bases were found upon the lower soil zones of blowouts, wherein no marl was exposed. None were found in or upon the upper soil zones, or sands. Mr. Perry Andersen states that he has recovered Yuma points *in situ* in the marl.

Hypothesis 2. Such points were contemporaneous with at least some of the marl and adjacent soil zones. Yuma points and points typologically related to Yuma points were no longer made at the time the upper soil zones were formed.

Fact 3. One Folsomoid point was found upon the "yellowish sand"; another was in the deep central portion of a blowout in a spot where both marl and "yellowish sand" occurred; and one probable Folsom base was found in a blowout containing "yellowish sand." Mr. Perry Andersen states that he has recovered Folsom points *in situ* in the marl. No Folsom or Folsomoid points were found in blowouts where the "yellowish sand" was absent, but two were found in blowouts containing little or no marl. No Folsom or Folsomoid points were found in or upon soil zones and sands above the marl level.

Hypothesis 3. Folsom and Folsomoid points were in part contemporaneous with the "yellowish sand" and marl, and do not post-date the marl.

Consequently the artifacts have been assigned to three rough chronological divisions:

1. "Recent" artifacts, i.e., those artifacts found in or upon the upper soil zones and sands.

2. Artifacts associated with the marl and lower soil zones. They are often heavily patinated.

3. Folsomoid artifacts associated with the "yellowish sand" and to some extent with the marl lying immediately above.

Each category will be separately discussed. The typological definitions and the brief remarks as to the distribution of the types are based upon a study of the lithic artifacts of North America which constituted my doctoral dissertation.[2]

[2] Gebhard, 1946.

"RECENT" LITHIC ARTIFACTS

I. Points (some also suitable as knives).
  A. Stemless notchless points.
    1. Triangular points (Fig. 47, *a*).
      Outline: Essentially triangular.
      Lateral edges: Straight or nearly so.
      Base: Straight to mildly concave.
      Length: 19.0–26.0 mm.
      Width: 50–80 per cent of length.
      Thickness: 2.5–3.5 mm. (All thicknesses given are maximum.)
      Number found: 4.
      Distribution: Widespread. In the Plains and Prairie the type does not seem to antedate Middle Mississippi influences.
    2. Triangular triconvex (Fig. 47, *b*).
      Outline: Like a triangle with all sides mildly convex.
      Lateral edges: Convex.
      Base: Convex.
      Length: 18.5 mm.
      Width: 13.0 mm.
      Thickness: 5.0 mm.
      Number found: 1.
      Distribution: No significance.
  B. Side-notched points.
    1. Acutely side-notched points (Fig. 47, *c*).
      Outline: Like a triangle superimposed on a shorter rectangle of equal width.
      Lateral edges: Straight to mildly convex above the notches. Straight and parallel below the notches.
      Base: Straight to moderately concave.
      Notches: Acute, opposed, and located at a point one-fifth to one-third of the total length from the base.
      Length: 14.0–35.5 mm.
      Width: usually 30–60 per cent of the length. Maximum width usually at the base.
      Thickness: Tend to be thin. 2.5–3.5 mm. commonest. Maximum thickness near or at neck.
      Number found: 33.
      Distribution: Common in Plains and Prairie. Also moderately common in the Anasazi area and Upper Mississippi-Ohio. In the Plains and Prairie the type occurs from a Signal Butte III-Upper Republican level to the protohistoric.[4] In the Anasazi area the type dates Pueblo II-V.[5]
    2. Side-notched base-notched points (Fig. 47, *d*).
      Like the above type except that the base is straight and contains a central acute notch.
      Number found: 2.

[4] Strong, 1935.

[5] Rinaldo, 1941; Morris, E., personal communication.

Distribution: These occur in the Plains and Prairie at a general Middle Mississippi-Upper Republican time-level, although a very few are reported from Signal Butte I.[6] Other examples have been found in the Promontory culture[7] and with Ute material.

3. Side-notched bifurcate flaring-base points (Fig. 47, *e*).
   Outline: Like a triangle with an inverted Y-shaped stem attached to the base.
   Lateral edges: Convex. No lateral edge exists below the notches.
   Base: Moderately to deeply concave.
   Notches: Moderately wide to wide.
   Length: 23.0 mm.
   Width: 15.0 mm.
   Thickness: 3.0 mm.
   Number found: 1.
   Distribution: Occurs widely. Some were found in Signal Butte I[8] and one at the site of Steed-Kisker.[9]
4. Side-notched expanding-stem points (Fig. 47, *f*).
   Outline: Like a triangle with a central stem which increases in width as it extends away from the blade.
   Lateral edges: Straight to convex. No lateral edge exists below the notches.
   Base: Essentially straight and from half as wide to as wide as the blade.
   Length: 23.0–37.0 mm.
   Width: 30–50 per cent of the length.
   Thickness: 4.0–7.5 mm.
   Number found: 4.
   Distribution: In the Plains and Prairie these seem to have been most in use prior to the acutely notched points. Examples occur at Signal Butte I,[10] Renner,[11] and in preceramic horizons in Arkansas.[12]

C. Diagonal-notched points.

1. Simple diagonal-notched points (Fig. 47, *g*).
   Outline: Trianguloid with two notched corners.
   Lateral edges: Convex to almost straight.
   Base: Straight to mildly concave and at least two-thirds as wide as the blade.
   Notches: Moderately wide so that the resultant barbs do not project proximally as far as does the base.
   Length: 16.5–43.5 mm.
   Width: 50–85 per cent of the length.
   Thickness: 2.5–6.5 mm.
   Number found: 26.
   Distribution: Widespread. In the Plains the type occurs more commonly in the earlier levels as, for example, at Signal Butte where 47 were found in Layer I, 17 in II, and 6 in III.[13] In the Southwest the type is more a Bastketmaker than a Pueblo point.[14]
2. Baso-diagonal-notched points (Fig. 47, *h*).
   Outline: As above.
   Lateral edges: Convex.
   Base: Straight to concave and from one-third to two-thirds as wide as the blade.
   Notches: Rather deep and more nearly parallel to the longitudinal axis of the point so that the resultant barbs project as far or nearly as far as the base.
   Length: 26.0–43.5 mm.
   Width: 50–75 per cent of the length.
   Thickness: 3.0–5.0 mm.
   Number found: 4.
   Distribution: Some are reported from Pictograph Cave II.[15]
3. Diagonal-notched fir tree points (Fig. 47, *i*).
   Outline: Like a fir tree with a thick trunk which expands at the base.
   Lateral edges: Concave.
   Base: Straight to mildly concave and from one-half to two-thirds as wide as the blade.
   Notches: Large. The resultant barbs do not project as far proximally as does the base.
   Length: ?
   Width: 20.0 mm.
   Thickness: 5.0 mm.
   Number found: 1.
   Distribution: Not usual in the Plains.

D. Straight-stemmed points.

1. Straight-stemmed right-angle shoulder points Fig. 47, *j*).
   Outline: Like a triangle with a straight central stem.
   Lateral edges: Straight to convex.
   Base: Straight.
   Stem: 50–75 per cent as wide as the blade and less than 30 per cent of the total length of the point.
   Shoulders: Essentially right-angled.
   Length: ?–27.0 mm.
   Width: In intact specimen, 63 per cent of length.
   Thickness: 4.5–6.5 mm.
   Number found: 3.
   Distribution: Widespread. Moderately common in the Plains. Occurs in all levels at Signal Butte.[16]

[6] Strong, 1935.
[7] Steward, 1937.
[8] Strong, 1935.
[9] Wedel, 1943.
[10] Strong, 1935.
[11] Wedel, 1943.
[12] Harrington, 1920.
[13] Strong, 1935.
[14] Rinaldo, 1941.
[15] Mulloy, unpublished MS, 1944.
[16] Strong, 1935.

2. Straight-stemmed simple barbed points (Fig. 47, *k*).
   Shape like the above type except that the shoulders are barbed.
   Length: 21.5 mm.
   Width: 12.0 mm.
   Thickness: 3.5 mm.
   Number found: 1.
   Distribution: Widespread.

II. Drills: Only three found.
   A. Two drills are *uniface* with irregular oblate bodies and short piles. Such *uniface* drills with expanding bases have been found chiefly in the Plains, as at Lindenmeier,[17] Signal Butte,[18] Hagen,[19] and Pictograph Cave.[20] Apparently they were manufactured from Folsom times onward.
   B. The third drill has a more regular oblate body, bearing two opposed side-notches. The pile, broken, is relatively narrow and carefully made. Such notched drills are more common east of the Mississippi, but two were found in Signal Butte I[21] and two at the Renner site in western Missouri.[22]

III. Scrapers.
   A. End scrapers.
      1. Snub-nosed scrapers: Twenty-two were found. The snub-nosed end edge has received more attention and use than the lateral edges. In outline the scrapers range from oval to petaloid to trapezoidal to irregular; the outline seems to have been largely fortuitous. All are, of course, plano-convex in section and wholly or primarily *uniface*. In only three did the width exceed the length and only five possessed a longitudinal keel. The maximum thickness usually occurred at the snub-nosed end. In twelve cases use had resulted in hinge-fracturing, giving the snub-nose an undercut aspect in profile.
      Range in length: 18.0–60.5 mm. Average: 38.5 mm.
      Range in width: 19.5–40.0 mm. Average: 31.7 mm.
      Average difference between length and width: *Circa* 9.0 mm.

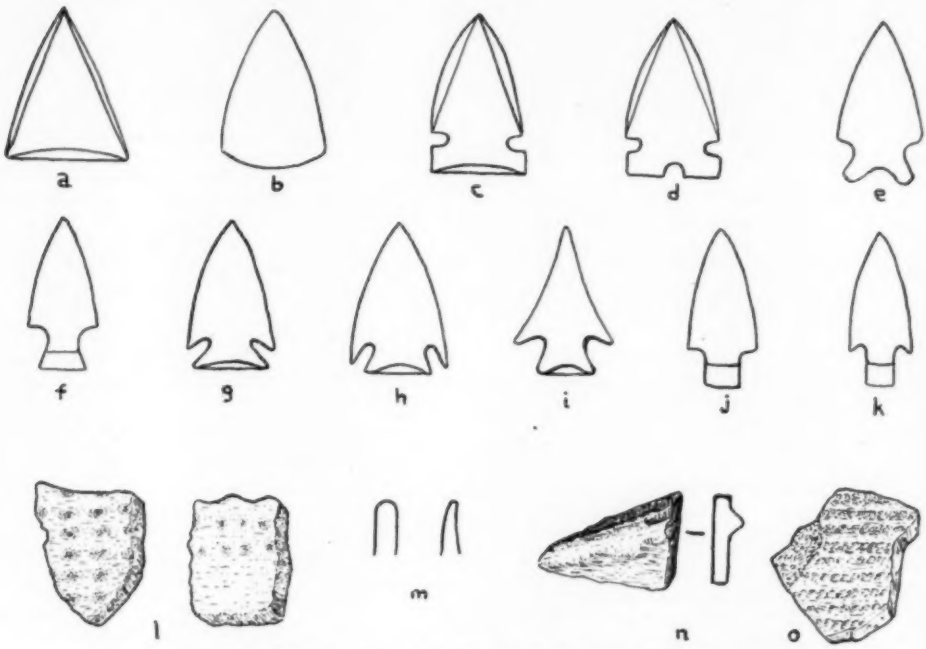

FIG. 47. "Recent" projectile points (*a–k*) and potsherds (*l–m*), Yuma County blowouts, Colorado

[17] Collection in U. S. National Museum.
[18] Strong, 1935.
[19] Mulloy, 1942.
[20] Mulloy, unpublished MS, 1944.
[21] Strong, 1935.
[22] Wedel, 1943.

Range in thickness: 7.0–21.0 mm. Average: 11.6 mm.

Distribution: Occur in virtually all horizons in the United States.

2. Non-snub-nosed scrapers: Four were found. These are thin *uniface* retouched flakes, shaped like a pie-wedge with a truncate apex, the wider convex edge being the working edge. They are approximately 21.0 mm.long and equally wide. Thicknesses were 3.0, 4.0, and 6.0 mm. in the three intact specimens.

B. Side scrapers: Sixteen were found, mostly broken. These are usually amorphous in outline; essentially plano-convex in section; usually *uniface;* and possess at least one retouched edge suitable for scraping or cutting. A few tend to merge with end scrapers typologically. The largest intact specimen was 85.0 mm. long.

C. Round scrapers: One round *uniface* scraper *circa* 26.0 mm. in diameter and 13.0 mm. thick with steep sides was found.

D. *Biface* notched scrapers or bunts: Two side-notched specimens were found. The notches were near enough the base so that no lateral edge existed below them. The bases were straight. These are probably re-worked points. Their measurements are 20.0×20.0×5.0 mm. and 17.0×22.0×6.0 mm. The type is uncommon in the Plains but a few occur in the Prairie, as at Renner.[23]

IV. Knives: These are *bifacial* edged tools too frail or too small to have served for chopping and unsuited for use as projectile points. The cross sections are essentially lens-shaped. In addition to 12 fragments and 3 amorphous specimens, two types were distinguished.

A. Ovaloid to rectanguloid knives: Four broken specimens were found. The range in width was 22.0–40.0 mm. and in thickness from 5.5–12.0 mm. Such knives are widely distributed in North America in time and space, the earliest being found at the Lindenmeier site.[24] Thin, well-made examples seem commoner in the Plains.

B. Alternate-beveled knives: One intact well-made example with a trapezoidal basal portion tapering to a long point was found. The tapering portion is left beveled. It is 105.0 mm. long with a maximum width of 37.0 mm. and a maximum thickness of 9.0 mm. In the Plains and Prairie such knives (or points) begin at a Signal Butte III-Upper Republican time-level and continue into the protohistoric period.[25]

V. Manos and metates: Fragments of slab metates with no evidence of marked basining were found. The manos, often just utilized cobbles, usually possessed one flattish to convex grinding surface and seem to have been used chiefly in reciprocal fashion.

VI. Gravers: Seven small amorphous *uniface* flakes bearing a very small sharp point were found. These points as well as the lateral edges bear tiny flake scars which could as easily be the results of use as the results of intentional retouch. Hence the designation of these artifacts as gravers is open to question.

VII. Miscellaneous: Under this heading fall six blocky amorphous roughly percussion-flaked edged objects which may be nuclei, crude small choppers, or by-products of manufacture. Their discontinuous peripheral edges are ragged and some show battering. They are quite thick in relation to their other dimensions. The maximum dimensions range from 40.0–65.0 mm. and the maximum thickness about 25.0 mm.

Also under miscellaneous are numerous utilized flakes possessing some intentional edge retouch. A few such flakes were found on the marl but cannot be differentiated from the "Recent" specimens. One small smooth pebble *circa* 54.0×41.0×10.0 mm. was found. Its surfaces were rubbed smooth and seemed slightly greasy. The periphery was blunt and battered.

Lastly, one small oval *biface circa* 32.0 mm. long with a blunt peripheral edge was found.

"RECENT" SHELL ARTIFACTS

In Blowout B-1 two shell disc beads *circa* 5.5 mm. in diameter were found associated with sherds. The beads are not of uniform thickness, but at one point measure *circa* 3.0 mm. and at the opposite periphery only 1.0 mm.

"RECENT" CERAMIC ARTIFACTS

Sherds were found in Blowouts B-1, C, E, F, P, and Theta.

Sherds in Blowout B-1

Rim sherds: 3.

Punctate sherds: 4.

Sherds with relief: 2.

Body sherds: 34.

Paste: The paste was fairly hard but brittle so that some sherds may be broken between the fingers. The color ranged from medium grey to black. A few show dark interior surfaces grading to brown near the exterior surface, which was grey or black. The temper is always sand. Apparently the sand was utilized with little or no sifting, for the particles are like those of ordinary blowout sand. Many particles are 1 mm. in diameter, the largest are about 2 mm., and one 3 mm. particle was noted. Most of the temper, however, would pass through an ordinary window screen. Little or no mica is evident.

Manufacture: Apparently paddle and anvil, although no

[23] Wedel, 1943.

[24] Collection in U. S. National Museum.

[25] Strong, 1935.

sherds were large enough to show an anvil depression. No evidence of coiling. One sherd shows laminations parallel to the surfaces.

Surface treatment:

A. Smoothing: The sherds were smoothed both internally and externally, usually in rough fashion, with the interiors receiving most attention. Some parallel striae are noticeable. On nearly all of the sherds the smoothing has concealed the larger particles of temper; manipulation of surfaces seems to have brought the finer clay to the surface, creating a sort of pseudo-slip or wash effect.

B. Punctation: Oval depressions, evidently made by a stick with a round end, occur on four sherds. The punctations are uniform on each sherd; their axes are parallel; and they are essentially at right angles to the surface. The largest punctations are about 5.0 mm. long and 3.5 mm. wide. Two sherds are too small to indicate the arrangement of the punctations, but on the other two they are arranged in parallel rows. The punctations are not staggered, but directly above one another (Fig. 47, *l*).

C. Relief: Two sherds displayed relief. A separate fillet of clay seems to have been moulded on each, the fillet being pinched up as shown in Figure 47, *n*. The fillets are about 7.0 mm. wide at the base and extend outwards from the sherd surface approximately 4.0 mm. One sherd looks as though it may have possessed two such fillets lying parallel and about 4.0 mm. apart. These relief sherds bear no punctation or other decoration.

Rims: Two of the three specimens have simple rounded rims, the third possessing a rim which has been markedly thinned before being rounded (Fig. 47, *m*). The largest rim sherd was only 45.0×20.0 mm., so that eversion, etc., could not be deduced.

Thickness of sherds:

Rim sherds: 6.0, 7.0, and 7.5 mm.

Punctate sherds: 6.0 (2), 6.5 (1), and 7.0 mm. (1).

Relief sherds: Measurements taken on the fillet and also on the body proper are 10.0 and 6.0, 10.0 and 7.0 mm.

Body sherds: 5.5 (1), 6.0 (10), 6.5 (6), and 7.0 (7), 7.5 (5), 8.0 (4), and 9.0 mm. (1).

Note: Punctate sherds occur sparsely elsewhere in Colorado east of the Rocky Mountains.[26]

Sherds in Blowout C

Body sherds: 9.

Paste: Moderately hard almost black to grey paste with grey to buff exteriors and interiors. In eight cases the temper is concealed by the smoothing. Temper is fine sand, although there are occasional larger particles ranging up to 2.5 mm. in diameter.

Manufacture: Definitely paddle and anvil. Some anvil depressions are to be seen and there is some lamination parallel to the surfaces.

Surface treatment:

A. Smoothing: As in the B-1 sherds. Three were found.

B. Cord-marking: Six sherds were cord-marked. The cords seem to have been 1.5–2.0 mm. in diameter except in one sherd where the diameter seems to have been perhaps 3.5 mm. The cord-marks are parallel (Fig. 47, *o*).

Thickness of sherds: 6.0 (1), 6.5 (3), 7.0 (2), and 7.5 mm. (2). One sherd was longitudinally split so no thickness could be measured.

Note: Such cord-marked sherds occur elsewhere in Colorado.[27] These sherds are evidently like some from the Upper Republican culture.[28]

Sherds in Blowout E

One body sherd 5.0 mm. thick was found. The paste is hard and grey with fine sand temper, the largest particle being 1.5 mm. in diameter. The exterior bears traces of cord-marking.

Sherds in Blowout F

Body sherds: 7.

Paste: Dark grey to black paste with coarse sand temper ranging up to particles 3.0 mm. in diameter.

Manufacture: Seems to be paddle and anvil.

Surface treatment: Roughly smoothed.

Thickness of sherds: 5.0 (1), 5.5 (2), and 6.0 mm. (4).

Note: This seems to be the same ware as in Blowout B-1.

Sherds in Blowout P

Three body sherds, rather coarsely sand tempered but with no particles larger than 1.0 mm. were found. The paste is dark grey becoming buff near the surfaces. Thickness is 4.0–6.0 mm.

Sherds in Blowout Theta

One body sherd was found. The paste is dark grey, becoming grey-brown on the surface. Small sand temper. Smoothed roughly. 8.5 mm. thick.

NOTE

Inasmuch as no habitation site representing more than a temporary camp was found, the sample of "Recent" material is probably not representative except, possibly, insofar as projectile points and scrapers are concerned. Therefore it is difficult to equate the material with any recognized culture within the Plains.

ARTIFACTS ASSOCIATED WITH THE MARL AND LOWER SOIL ZONES

These artifacts include Yuma points and some additional points bearing typological relationship to Yuma points. The remainder are not typologically Yuma nor are they, as a class, especially similar to the "Recent" ma-

[26] Renaud, 1932.

[27] Renaud, 1932.

[28] Strong, 1935.

terial. The small number of artifacts assigned to the marl and lower soil zones is in part the result of our extreme caution and in part due to an actual scarcity. Wherever it seemed reasonably possible for an artifact to have washed or rolled to a lower level, such an artifact was not considered to belong to the stratum on which it rested.

I. Artifacts from the lower soil zones without Yuma similarities.

W-1-2, 24596.[29] This is a carefully flaked essentially triangular point with a moderately concave base. The dimensions are 54.5×25.0×7.0 mm. The basal region has been markedly thinned on both surfaces by the removal of several flakes in a longitudinal direction, i.e., in Nepesta-like fashion.[30]

C-1, 24469. A similar smaller point, 43.0×24.5×5.5 mm.

K-1, 24540. A small crude roughly teardrop shaped point. It is *biface* but plano-convex in section. 26.0×16.0×4.0 mm.

V-6, 24590. This is a small narrow spicule-like point made on a prismatic flake. 25.5×9.0×2.5 mm.

Eta-2, 24643. This is a carefully flaked leaf-shaped point measuring 43.0×15.0×4.0 mm.

Theta-1, 24646. This is a side-notched expanding stem point measuring 32.5×19.0×5.5 mm.

Z-1-1, 24605. This is a broken point with a shallow constriction near the base, producing a sort of fish-tail effect. Base is concave. Rather careful small flaking. ?×12.0×4.0 mm.

U-5, 24584. The basal portion of a thick point with two wide shallow notches near the base so that no lateral edge exists below them. Base mildly concave. Boldly flaked. Present measurements 34.0×21.0 ×12.5 mm.

E-2, 24498. The basal portion of a thick point whose convex lateral edges gradually converge and then become essentially parallel, producing what might be termed a straight stemmed point with gradually sloping shoulders. Base straight. Present measurements are 38.0×21.0×8.0. The stem is 14.0 mm. wide.

Epsilon-5, 24630. The tip of a thick point measuring 38.0×18.0×7.5 mm.

L-5, 24543. A fragment of the blade of a point. Large shallow flake scars. Width is 20.5 mm. and thickness 4.5 mm.

Beta-5, 24621. Large fragment of a side-scraper or chopper. Maximum dimension 68.0 and maximum thickness 17.0 mm. The edge bears careful *unifacial* retouch.

II. Artifacts from the marl without Yuma similarities.

D-1-1, 24492. A large essentially rectangular flake 70.0×52.0×12.0 mm. Covered with a hard pitted encrustation.

E-52, 24512. A fragment of a side-scraper like specimen Beta-5, 24621 described above. Maximum dimension 46.0, maximum thickness 9.0 mm.

W-1-3, 24595. A roughly triangular *uniface* end scraper, more or less snub-nosed with the scraping edge convex. Carelessly flaked with hinge-fracture on the nose. Measuring 46.0×49.0×12.0 mm.

W-1-4, 24598. A thick utilized flake with calcareous patination. 36.0 mm. long.

Z-1-11, 24604. A utilized flake bearing some careful *unifacial* retouch. Maximum dimension 36.0 mm.

Z-2-?, 24612. An oval side scraper, essentially *uniface* with one edge carefully and *unifacially* retouched. 68.0×48.0×11.0 mm. Found slightly embedded in marl.

Z-2-2, 24615. A large utilized flake bearing a heavy calcareous patination. 82.0×60.0×16.0 mm. Found embedded in the marl.

Z-2-3, 24613 (Fig. 48, *d*). An intact point with two wide notches near the base so that no lateral edge exists below them. The base is slightly concave. The flaking is expertly done and the long shallow scars are parallel. 57.0×22.0×5.0 mm.

Z-2-6, 24611 (Fig. 48, *a*). A long thick intact point with bold but well controlled flaking. The lateral edges are slightly convex as they diverge from the tip but gradually become parallel forming a sort of stem. Straight base. Thick lens-shaped cross section. The point is covered with a hard white thin patination. 81.5×21.5×8.0 mm. Stem width 16.5 mm.

Z-2-7, 24611 (Fig. 48, *c*). Quite similar to the above point except that there is a more marked distinction between the blade and stem. The point is covered by a hard white patination and is iron stained at the tip. 68.0×21.5×9.5 mm. Stem width is 15.0 mm.

III. Artifacts with Yuma similarities from the marl or lower soil zones.

E-9, 24494 (Fig. 48, *f*). An intact Scottsbluff type Yuma. Large shallow well controlled flaking. Thick lens-shaped cross section. The basal corners and shoulders are right angles. Base straight. 66.0×30.0 ×8.0 mm. Stem width 26.0 mm. Stem length 19.5 mm. Found on the marl.

Z-2-5, 24610 (Fig. 48, *b*). An intact Scottsbluff type Yuma with a somewhat atypically narrow stem. Large shallow well controlled flaking. Thick lens-shaped cross section. 90.5×42.0×11.0 mm. Stem width 25.5 mm. Stem length 26.0 mm. Straight base. The point has a heavy calcareous patination. Found on the marl.

Z-1-2, 24602 (Fig. 48, *h*). A point with a basal portion like an Eden Yuma. The blade is too short and the flaking not typical enough to term this an Eden Yuma. Thick lens-shaped cross section. 53.0×18.0

[29] These, and all following specimens, will be identified by the field number and the museum (Peabody Museum of Harvard University) number. In the latter case only the lower specimen number will be given since the superior number is always 41-87-10, thus: 41-87-10 [acquisition number]/24596 [specimen number].

[30] The Nepesta type point was found in a Colorado blowout. Cf. Scoggin, 1940.

×7.0 mm. Stem width 15.5 mm. Stem length 11.0 mm. Found on the marl.

L-1, 24541 (Fig. 48, *e*). The tip and most of the blade are of a typical Oblique Yuma. 73.0×19.5×6.5 mm. Found on a lower soil zone.

Beta-1, 24619. The basal portion of an Oblique Yuma. 35.0×19.0×5.5 mm. Found on a lower soil zone.

?, 24541. A fragment of the blade of an Oblique Yuma. 28.0×18.5×6.0 mm.

U-10, 24583 (Fig. 48, *g*). An intact point, 34.0×21.5 ×6.5 mm., with parallel lateral edges which abruptly converge to form the tip. Deeply concave base. Lens-shaped cross section. Maximum thickness near the tip. Lateral edges seem to have been rubbed smooth near the base. Several flake scars form the shallow longitudinal fluting, some extending beyond the mid-point of the artifact. This stubby specimen is not unlike some of the poorer,

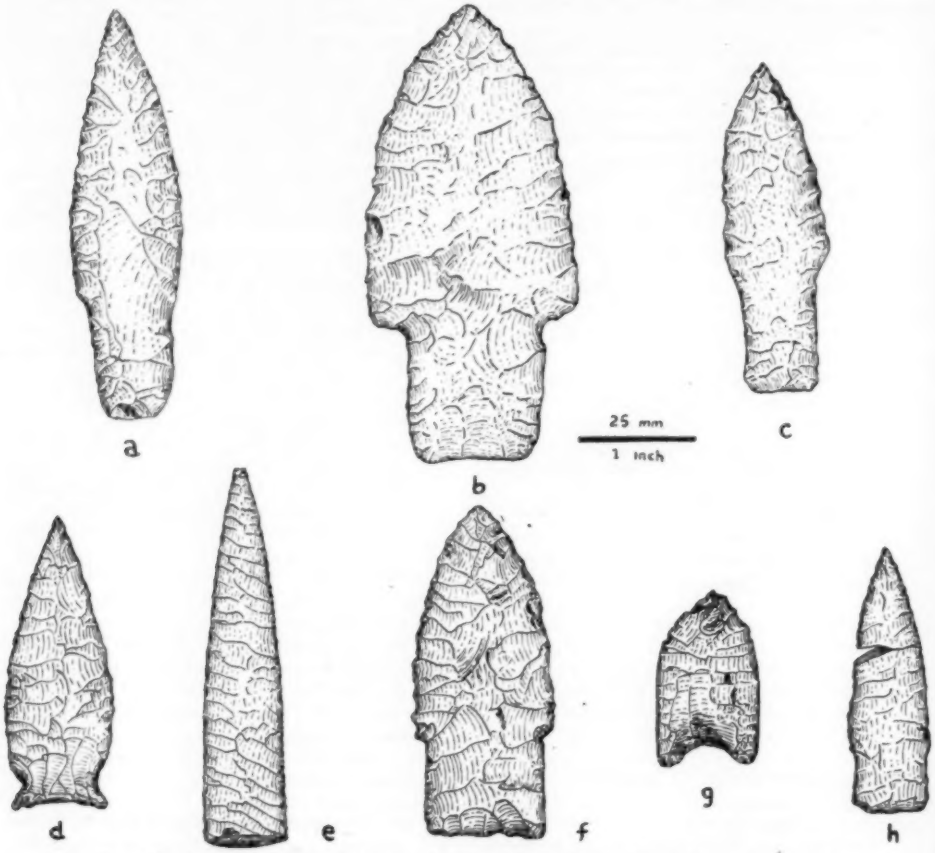

FIG. 48. Projectile points from the marl and lower soil zones, Yuma County blowouts, Colorado.

E-6, 24497. The tip of what seems to have been an Oblique Yuma. 39.0×16.0×5.5 mm. Found on the marl.

Beta-3, 24619 and *L-23, 24542*. Two bases precisely like those found on Eden and some Oblique Yumas. Sharp right-angle corners. Uniform basal thinning. Careful flaking. Thick lens-shaped cross sections. Found on lower soil zones.

IV. Folsomoid artifacts associated with marl and "yellowish" sand.

shorter Lindenmeier examples. Found on the "yellowish" sand.

X-2, 24599. The basal portion of a fluted point, 18.5 ×21.5×5.5 mm. Lateral edges parallel and dull. Base deeply concave. One major and several minor flakes have been removed from each surface to give a shallow longitudinal fluted effect. Lens-shaped cross section. Found in blowout containing "yellowish sand," exact strata unknown, but in the deepest part.

U-1, 24583. A smaller version of U-10 except that one must describe this as being basally thinned rather than fluted. Found where "yellowish" sand and marl were intermingled.

None of these points can be called Folsom solely on typological grounds. Their similarity to Folsom, their stratigraphic position, and the fact that true Folsom points have been recovered by Mr. Andersen from the same general horizon (and from the same blowout in the case of Blowout U) all combine to make it reasonable to assume that these points were manufactured within the time when the Folsom type of fluting was commonly practiced in the Plains.

CONCLUSION

This work, while unfinished, substantiates the previous opinions as to the relative chronological positions of Folsom, Yuma, and the later points characterized by notching and general thinness. It also provides further evidence of an ancient humid period in the Plains, at a time when the area was occupied by humans. Lastly, it contributes additional data as to the more recent occupants.

As is usual in science, the work presents more challenges than answers. Some of the more important of these are:

1. A careful study coupled with extensive excavation might permit us to devise a stratigraphic chart of the lake fluctuations and soil zones. The discovery of artifacts in the strata would then add most importantly to our knowledge of early man and Plains archaeology in general.

2. The artifacts associated with the marl and lower soil zones indicate that certain reasonably distinctive points which are not now considered as Yuma were contemporaneous with Yuma points.

3. The precise relationship of Folsom to the marl and pre-marl deposits merits particular attention.

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Indiana University
Bloomington, Indiana
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A PRELIMINARY REPORT ON EXCAVATIONS IN SOUTHWESTERN COLORADO

ALFRED K. GUTHE

ARCHAEOLOGICAL research has been conducted in the Mesa Verde area of Southwestern United States since the 1880's. Because of this, many believe that the prehistory of the area is well known. Nevertheless, J. O. Brew, in a recent summary of available information on the area, concluded that a great deal of work is still needed.[1]

This preliminary report is submitted in the hope that it will provide more information for an archaeological interpretation of the area. It is a report on excavations conducted at the Cahone Ruin during the summer of 1947.

The Cahone Ruin is located in southwestern Colorado: Township 39 North, Range 18 West, in Dolores County, just north of the Montezuma-Dolores County line. It is found on a natural rise about 500 yards north of the northern rim of Cahone Canyon, a tributary of Cross Canyon.[2] From this natural elevation, one may view much of the Montezuma Valley. The La Sal Mountains lie to the northwest, the Abajo (or Blue) Mountains to the west, and the La Platas to the east of the ruin. The small village of Cahone, Colorado, on the Monticello-Cortez highway (U. S. 160) is about 3½ miles east of the ruin.

The ruin is roughly D-shaped and covers an area of about 20 acres.[3] The shape is generally indicated by a single line of occupation units. However, along the northern side a double line exists. The straight side of the *D* lies along a rise of ground running generally northeast-southwest. The curved portion lies north of this straight side and has a gap of about 100 feet in its northwestern part.

At the western end of the *D* is a multi-storied structure with walls now standing approximately 20 feet high and measuring about 10 inches wide. This structure is about 50 feet (N-S) by 35 feet. It represents a later occupation, since it was built on the refuse of the small occupation units at that point.

The D-shaped outline encloses a large circular depression 100 feet in diameter. This is obviously man made and may be either a great kiva or a reservoir. Subsequent excavation will provide more information.

In the preceding paragraphs, I have used the expression "occupation units." Each occupation unit consists of a pile of sandstone blocks, a depression, and a small mound covered with occupational debris. The pile of stones usually lies just north of the depression and northwest of the mound covered with refuse. One such unit, consisting of two mounds with occupational refuse and burials, a stone pile with remnants of surface rooms, and a depression, or the remains of a kiva, was partially excavated during the 1947 season. Assuming that similar surface configurations contain similar cultural evidence, we have been led to designate each of the configurations an occupation unit. Each of the features excavated in the 1947 season will be discussed and interpreted.

HOUSE STRUCTURE

The house structure was small. Prior to its excavation this mound of stone slabs and dirt, at its highest part, stood only about 3 feet above the general ground level. At the present stage of excavation, the house ruins indicate the former presence of a five-room, single-storied structure which had an L-shaped floor plan and was one room wide (Fig. 50). The longer portion of the house measures 29 feet; the shorter portion, 16 feet. Four rooms comprise the longer side, and two rooms constitute the short side of the *L*. The long wall is oriented approximately east-west. The number of building stones removed during the excavation suggest that it was a single-storied structure.

The highest walls now stand 20 inches. There are a maximum of five courses in walls

[1] Brew, 1946, pp. 15–31.

[2] The ruin is on land owned by Ansel F. Hall, of Mancos, Colorado, who is the director of a summer camp for high school boys (The Explorers' Camp). The excavation of the ruin is part of the camp's annual summer program, and is directed by a worker who has had some archaeological training. The writer was the second graduate student in Anthropology to direct the excavation of a portion of the ruin. During the summer of 1946, the excavation of one trash mound and a surface structure was conducted by Samuel J. Tobin, a graduate student at the University of Utah.

[3] Since the dimensions given for this ruin are approximations, a sketch map has been prepared to assist the reader (Fig. 49).

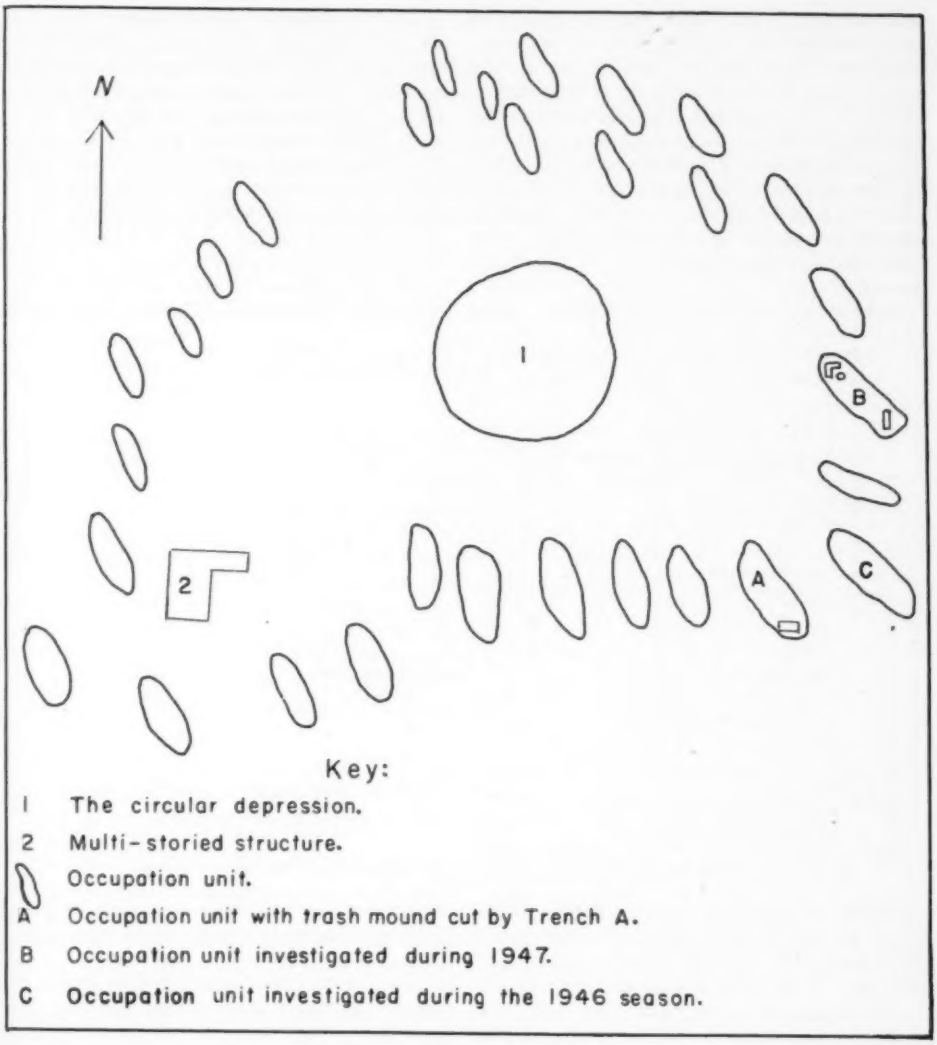

FIG. 49. A sketch map of the Cahone ruin, Colorado.

of this height. One wall may have both thin and thick slabs of sandstone. The coursing resulting from such a variation in stone size is crude at best. It is non-Chacoan in type. There is stone to stone contact, with clay and spalls used to fill the interstices, a type of masonry designated by Roys as "Dry Masonry Technique with Voids Filled with Mud."[4]

[4] Martin, Roys, and von Bonin, 1936, p. 126.

A few of the building stones have been shaped to produce an even face. This is indicated by a pitted or dimpled surface.

There is evidence that the house was modified after it was first constructed. The north wall of Room D (Fig. 50) abuts the east wall of Room C. This indicates that it was added after the walls of Room C had been built. The nature of the wall between Rooms A and B has not been definitely determined. On one

side (Room B), the stones were well laid. The other side of this wall presents no such appearance. There is no vertical face, nor are the corners square. Further study of this wall is needed. It is suggested that one room of the original structure was divided into two compartments (Rooms A and B) by the addition of this wall. The presence of stone slabs on what is probably the floor of Room B indicates that it was paved with flagstones. Such floors have not, as yet, been found in the other rooms.

Before the close of the season, the lower course of masonry had been located in Rooms A, C, D, and E. In Room C the digging had continued to a depth of 6 inches below this. Perhaps, these walls had a mud foundation.

Not all of the rooms have four walls. The southern and eastern walls of Room C are represented by spurs jutting out from the west and north walls. The south wall and part of the east wall of Room D is not present. In the case of Room C, it may be that the southern wall collapsed into a tunnel leading into the kiva, or into the kiva itself which is within 5 feet of the probable location of this south wall. Room D may be a misnomer. Perhaps this was only an enclosure or windbreak and had only three walls. It is hoped that subsequent excavation will furnish the correct interpretation.

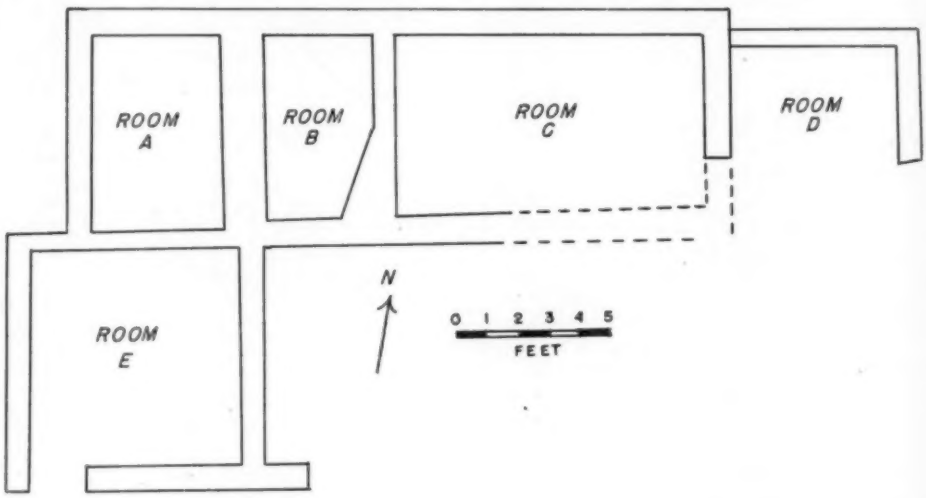

FIG. 50. Plan of the house structure, Cahone ruin, Colorado.

The fill of these rooms contained two fragmentary indented corrugated vessels, several sherds of both black-on-white and indented corrugated wares, assorted chipped stone artifacts, a lap stone, a mano, fragments of manos, a whetstone-shaped stone, and an ash deposit. The pottery represents the same types as those found in the refuse mounds and will be discussed more fully under that heading.

KIVA

The excavation of the kiva was not completed during the 1947 season. However, there is little doubt that it was a kiva; the nature of the fill and the position of this structure with respect to the house lead to this conclusion. Charred timbers were encountered 6 feet below the ground surface.[5] Large fragments of one corrugated vessel were obtained immediately above the timbers. A piece of charred basketry was found in the eastern face of the trench. This basket fragment has yet to be analyzed. Another feature encountered in the excavation was a deposit of white clay, which was located in a part of the trench believed to be near the kiva wall. The deposit was approximately 3 feet beneath the ground surface and measured 12 inches on the horizontal. Its vertical measurement was 9 inches.

[5] Portions of these have been preserved for dendrochronologists.

REFUSE MOUNDS

The two refuse mounds contained quantities of potsherds, several chipped or ground stone artifacts, bone tools and fragments, and other cultural refuse. The mounds also yielded five burials. They were shallow, the depth of the debris not exceeding 2 feet in either mound.

Trench A cut through one mound, which is about 50 feet in diameter. The trench was 10 feet wide and extended somewhat beyond the edges of the mound. Twenty-two 5-foot squares were excavated, and the artifacts recovered were separated according to 6-inch levels within each square.

A second trench (Trench B) was started in an attempt to bisect another mound, but the season ended before the trench could be completed. This mound is believed to be associated with the house ruin and partially excavated kiva. Dirt was removed from an area 10 feet wide and 25 feet long. Again the material recovered from each 6-inch level within a 5-foot square was bagged separately.

A typical 5-foot square yielded approximately 600 sherds. These represent three wares: Almost 45 per cent of the sherds are black-on-white, 50 per cent are culinary, and the remaining 5 per cent are red ware. A more detailed statement will follow in a later section.

BURIALS

Five burials were taken out during the season, three in Trench A and two in Trench B. All had been partially disturbed by burrowing animals.

Two skeletons from Trench A are identified as females who were approximately 45 years of age at death. Each of these skeletons was in a pit beneath the general level of refuse in the center section of the mound. The presence of these pits was not indicated in the soil above them, apparently because the refuse deposit is fairly uniform in appearance and content and is not compact.

The two burials were quite similar. They were both formal interments with grave goods. The bodies were in an extended position and their skulls had been artificially deformed. Each was partially covered with stone slabs, but no attempt had been made to form a cyst or box for the dead. The grave goods consisted of pottery vessels and two humerus scrapers (Burial 2 only), placed along the right side of the skeleton between the pelvis and the skull. The skull of Burial 1 was covered with the basal portion of a large indented corrugated vessel. In addition to these artifacts, which are definitely grave goods, two additional tools were found in the fill of Burial 2, a bone scraper and a triangular side-notched projectile point. It is not possible to say they were definitely associated with the burial for they were in an area disturbed by animals.

Burial 3, Trench A was located somewhat west of the center of the mound and was not in a pit, although it had been formally interred in the refuse deposit. The skeleton was that of a child, extended and partially covered with stones of various sizes and shapes. A single pottery pitcher had been placed near the right shoulder. Associated with this burial, but perhaps not intentionally, was a triangular corner-notched point which was found in the fill.

The burials in Trench B differed from those in Trench A. Burial 1 consisted of the flexed skeleton of a male who died when about 35 years old. The torso was in a supine position, the legs were flexed to the right, and the skull lay on its right side. This skeleton was found in a pit which was below the general level of the refuse deposit, but without indication of having been dug down through the refuse. As was the case with the other burials, several stones had been placed over this one, a trait which was also fairly common in the La Plata region, about 100 miles east of the Cahone Ruin.[6] Grave goods consisted of four pottery vessels, one of which contained two fragments of polished stones. These vessels were located around the skull and shoulders of the skeleton, three of them lying on the left side.

Burial 2 in Trench B did not give the impression of having been a formal one. The bones were distributed over a 10 by 5 foot area of the refuse. There were three femora, three fibulae, three tibiae, four fragments of an innominate bone, one rib, and three vertebrae. None of these was articulated and no purposeful orientation was apparent. They were found in an area adjacent to that in which Burial 1 was located and were nearer the mound's surface than the latter. A few stones lay beneath the femora and a few larger than usual sherds were nearby. A superficial examination of the bones indicated that two femora, two fibulae, and two tibiae belonged to a single individual.

[6] Morris, 1939, p. 115.

A possible interpretation of this burial is that it represents two skeletons which had been placed in the ground prior to the interment of Burial 1. In preparing a hole for Burial 1, the diggers may have passed through the bones of what has been called Burial 2 and simply tossed them aside with the dirt. This interpretation is possible only if Burial 1 was made after some refuse had accumulated. The fact that no indication of the pit was found in the refuse above Burial 1 does not negate this possibility; as already indicated, the refuse is substantially homogeneous. The location of stones under the bones of Burial 2 tends to support this theory, for the other burials excavated during this season had stones placed over them. On the other hand, Burial 2 may have been a secondary one, or an informal one, in which case the bones might have been thrown on the mound along with the usual debris.

Table 30. Projectile Points and Their Provenance

Class	Location									
	Trench A Levels			Trench B Levels			Room	Trench A		
									Burials	
	0" to 6"	6" to 12"	12" to 18"	0" to 6"	6" to 12"	12" to 18"	E	Pit 2	2	3
a) Triangular, side-notched	6	2	1	1	1		1	1*	1	
b) Triangular, unnotched	4	1		1						
c) Triangular, corner-notched		1				1				1
d) Triangular, straight-stemmed	2	1								
e) Unclassified	7		1		1					

* Obsidian point.

STONE ARTIFACTS

An inventory of the chipped stone artifacts recovered during the 1947 season includes projectile points, saws, blades or knives, and drills. Of these, the projectile points are most numerous. Thirty-five points are represented in the collection, 16 complete specimens and 19 fragments for which the original form can be determined. For the purposes of this report, a detailed discussion of these points is not necessary. However, the general forms and their distribution will be indicated.

Four classes can be distinguished: triangular unnotched points, triangular corner-notched points, triangular straight-stemmed points, and triangular side-notched points. Nine points, or fragments of points, are not classified. These vary in shape and size and do not resemble the points in the four classes.

Of the common forms, the majority (14) have been assigned to the triangular side-notched class (Fig. 51, *a–k*). There are six triangular unnotched points (Fig. 51, *m–o*), three triangular corner-notched points (Fig. 51, *k–l*), and three of the triangular straight-stemmed class (Fig. 51, *i–j*). Their distribution is best presented by a table (Table 30), which indicates that no one class of point was used to the exclusion of the others during the period or periods of trash deposition.

The nine unclassified points vary in size, shape, and skill of manufacture (Fig. 51, *p, s, t*). Two, neither of them well made, are small and trianguloid with straight stems (Fig. 51, *s*). Both are flakes with secondary chipping only on the edges. Neither is more than 2.0 cm. long or 1.3 cm. wide.

Two other points are much larger, even though they are fragmentary. One is trianguloid with corner notches and a broad convex base (Fig. 51, *p*). The other is ovate, corner-notched, and has barbed shoulders and a convex base. These two points are reminiscent of the so-called Basket Maker points. The material from which they are made may account for the apparent crudeness of manufacture.

Three of the unclassified points are unilaterally notched and trianguloid in form (Fig. 51, *t*). Of the three, the largest measures 2.6×1.0×0.2 cm. The remaining two points are trianguloid and unnotched with convex bases.

The use of chipped stone drills is indicated

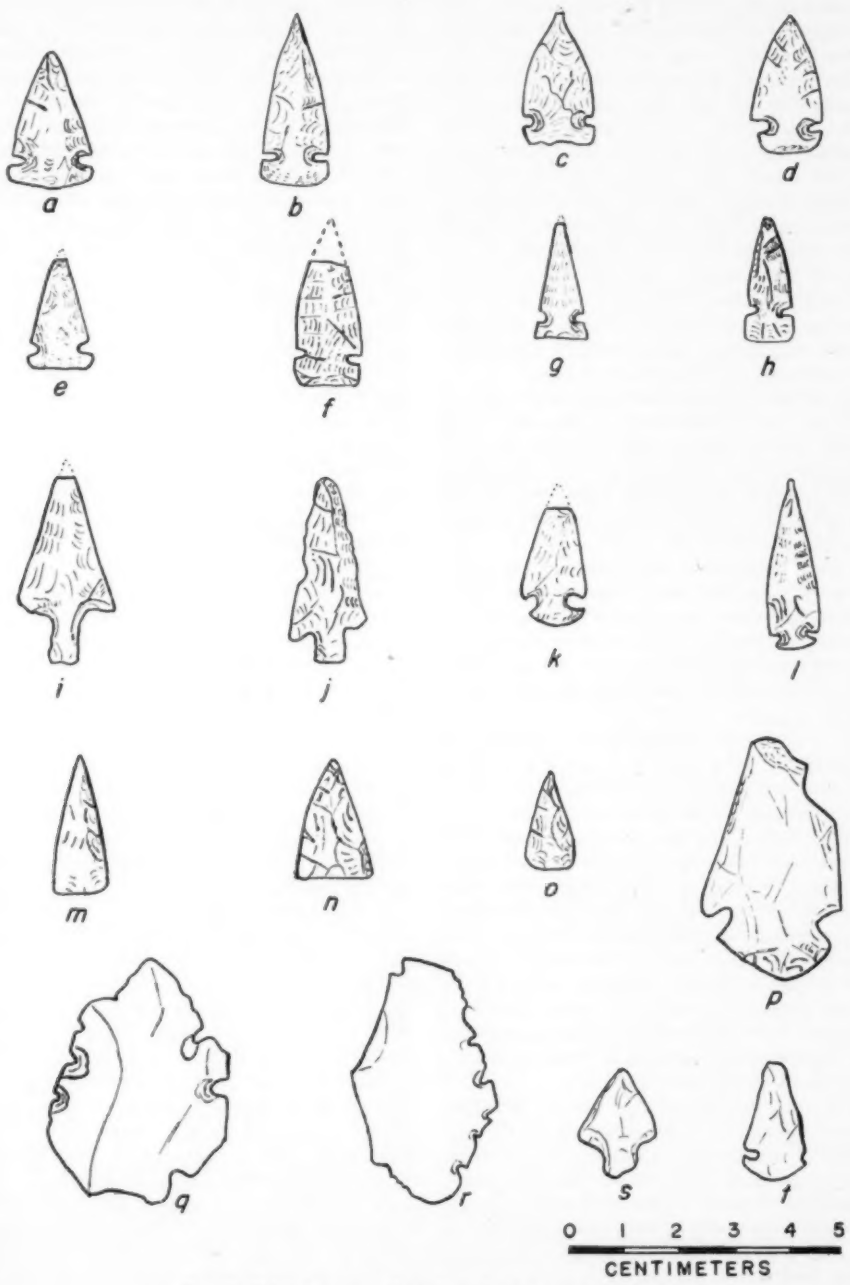

FIG. 51. Chipped stone artifacts from the Cahone ruin, Colorado.

by a rectanguloid, basal fragment with secondary chipping of a good quality. It was contained in the uppermost 6 inches of Trench A.

The artifacts designated as saws are secondarily chipped only where notches have been made (Fig. 51, *q*, *r*). Otherwise they are simply unworked flakes of varying sizes and shapes. Most of them exhibit a bulb of percussion. The number of edges present and the number notched varies with each specimen. The depth of the notches also varies considerably.

There are several fragments of blades, or knives. These exhibit a fine quality of secondary chipping. The majority are thin, with all edges capable of cutting. The complete specimens were probably trianguloid in shape.

One of the chipped stone artifacts could be placed in two of the above categories. It is shaped like a knife and exhibits over-all secondary chipping of good quality, resembling in these ways the knives. However, it has serrated edges, thereby qualifying as a saw. It was in the fill of Room E.

A few artifacts recovered during the 1947 field season are both chipped and ground. They probably represent implements discarded after considerable use, in which case the chipping occurred after the grinding. All such specimens will be discussed as ground or polished artifacts.

The majority of the artifacts of ground or polished stone are manos. Only one is complete. They can be grouped according to the two types outlined by Brew,[7] one with a single grinding surface and the other with two. The complete specimen has a single grinding surface which is convex from side to side. The other face is flat and the ends are rounded. This mano measures 21.5×11.0×2.5 cm. Two fragments have a pair of grinding surfaces both sloping toward a common side so that the resulting cross section is triangular. Two fragments have flat parallel grinding surfaces with the resultant cross section being rectanguloid. One is plano-convex.

With one exception, the convex grinding surfaces, could be called beveled, i.e., three-fourths of the surface is flat but at an angle to the other quarter of the surface. The angle is generally rounded. The narrower bevel of the surface is both ground and pecked in many instances. The exception is a fragment with a true convex surface.

Some of the fragments show that the typical mano had square ends with rounded corners. With one exception the stone used is a hard sandstone. The exception is a conglomerate.

Metates must have been used by these people, but only one fragment was recovered. This was of the trough type. Whether the ends were closed or open cannot be determined.

Three ground stone axes and three mauls were recovered. Each is grooved. The maul has a pecked, full groove. Two fragmentary specimens also exhibit pecked grooves. One has a full groove and was probably a maul. The other was either an adze or an axe with a pecked groove; whether it was a full or three-quarter groove cannot be determined. It has been broken longitudinally and the cutting edge and one side are missing. These specimens came from Trench A.

A few small fragments of ground stone pendants were recovered. These fragments indicate that the pendants were rectanguloid in shape and were generally small. One is 2 centimeters square. All are perforated near one edge.

Other ground stone artifacts include three circular beads with central perforations. They have diameters of 4 mm. The perforations are 2 mm. in diameter. These came from Trench A. One was in the upper 6 inches of trash fill, another in the 6- to 12-inch level and the third in the 12- to 18-inch level.

The last category of ground stone artifacts for which a use is postulated is polishing stones. Several highly polished stone pebbles were recovered from the trash mounds. These appear to be river pebbles, which were selected for their shape and hardness. They were probably used to polish pottery.

A collection of miscellaneous ground stone artifacts completes the specimens of this class. Just how these served the Indians is problematical. Three are polished fragments about 6 by 4 cm. in size. Two of these are black and were inside the indented corrugated vessel associated with Burial 1, Trench B. Other artifacts may have been pendants (the portion without the perforation), small abraders, whetstones, or perhaps merely "lucky pieces." One small stone ball is included in this category. It is approximately 1 cm. in diameter.

Pecked stone artifacts were also found. Some I have called hammer-anvils. These have peck marks on the ends and also a small pitted depression on one surface with an approximate diameter of 3.5 cm. They have a rectangular block shape. Five stone artifacts have peck marks on one or more surfaces and have been

[7] Brew, 1946, p. 240.

called hammerstones. Two of these are pecked on one end, but the sides are ground. Another two are chipped on the edges as well as pecked.

Several disks of sandstone were found which have been called pot covers. They average 4.5 cm. in diameter and are about 1 centimeter thick. These were found in the fill of the trash mounds.

BONE

Several thousand bones and fragments were recovered during the excavations. Almost all of these were recovered from the trash mounds. Several are of such a fragmentary nature that a definite identification as to the bone, or the probable animal or bird from which they came, is impossible.

The bones which were identified indicate that the Indians hunted or kept a variety of animals and birds. The list of animals and birds represented follows:[8]

Goose (*Branta*)	Eagle (*Aquila*)
Hawk (*Buteo*)	Turkey (*Meleagris*)
Rabbit (*Lepus*)	Squirrel (*Sciurus*)
Prairie Dog (*Cynomys*)	Ground Squirrel (*Citellus*)
Woodchuck (*Marmota*)	Kangaroo Rat (*Dipodomys*)
Pocket Gopher (*Thomomys*)	Wood Rat (*Neotoma*)
Porcupine (*Erethizon*)	Meadowmouse (*Microtus*)
Dog, or Coyote (*Canis*)	Bear (*Ursus*)
Weasel (*Mustela*)	Badger (*Taxidea*)
Deer (*Odocoileus*)	Mountain Sheep (*Ovis*)

Few bone artifacts were recovered. There are only 43 complete or fragmentary specimens. Of these 18 are awls (two from room fill), three are fleshers or scrapers, and three were probably used in connection with weaving. One is a needle, one is a bead, and 17 are unclassified.

Sub-types of the awls can be established on the basis of manufacturing technique. One sub-type consists of awls which retain at least part of the head of the bone from which they were made. Some of these heads have been modified by considerable grinding or scraping. Others have been only partially worked down by splitting the bone along its longitudinal axis. The other sub-type is represented by four awls formed from splinters modified in varying degrees, some only at the pointed end, whereas others show that some grinding or scraping was done along one surface of the splinter. Four of the artifacts classified as awls are only fragments. Two of these were formed from bird bones.

[8] Identified by Mrs. Dorothy B. Foss, Assistant, Vertebrate Anatomy, Department of Zoology, Chicago Natural History Museum.

The total number of awls recovered is small. However, the fact that two of the four splinter awls were found in the lower level of one trash mound (Trench B), while a third was found in a room of the house associated with this mound, may be noteworthy. The majority of the awls came from Trench A. The heads of the bone had been retained on all of these.

The three scrapers were found in association with a single extended burial (Burial 2, Trench A). Two of these lay side by side near the right humerus of the skeleton. These two are of the humerus type, which Morris describes as follows:

> The distal extremity of the humerus in its natural condition formed a curved knob which afforded a comfortable and secure grip for the hand. Occasionally the joint was left altogether unmodified, but in the majority of cases the ridges and sharper angles were reduced by grinding to smoother contours. The proximal end was cut or broken off just below its point of greatest width and the inner surface of the shaft was ground away diagonally until there was a gentle slope from blade to handle.[9]

The third scraper was fashioned out of a fragment or splinter of bone. Only one end of it was used.

It is unfortunate that the burial with which these scrapers were associated had been disturbed by a burrowing animal. Because of this, it is impossible to state that the splinter type scraper was definitely a part of the grave goods.

The classification of three of the bone artifacts as weaving tools is based in part on their shape and in part on the high polish which they possess. Only one of these tools is complete. It has been called a bodkin. It is a flat, rectangular bone splinter measuring 11.8×1.8 cm., and has a perforation which is near the least polished end.

The other weaving tools are fragmentary. All of the surfaces are smoothed and polished. One has a point on it and resembles an awl, but has been distinguished from the latter on the basis of its over-all polish. The other is the mid-portion of the artifact and is classed as a weaving tool only on the basis of its polish.

The needle was fashioned from a bone splinter. This was ground down to its present shape. Striations can be observed along one entire surface, and also on the opposing surface at the perforated end. The needle tapers to a point from the blunt end. The tip of the

[9] Morris, 1939, p. 122.

needle is missing; the present length is 12.6 centimeters; and it is 1.5 centimeters wide at the blunt end. Both surfaces carry a polish due to use.

The bead is a polished cylindrical object probably made from a fragment of bird bone. It has a diameter of 0.8 cm. and is 1.6 cm. long.

The 17 unclassified artifacts are fragmentary. Five are pointed, three are blunt-ended, and nine are from the middle portions of artifacts. Of the five pointed fragments, three may have been used as awls; two might have been used as flakers. The latter are thicker and rounder nearer the point than the awls in this collection.

One of the blunt-ended tools has a groove cut in it and may be a part of a bodkin, or some similar object. Another blunt-ended tool may have been an ornament. The bone has been split and the head has been worked down considerably. The surfaces are well smoothed and the edges are rounded.

The nine fragments from the middle portions of bone artifacts are difficult to describe. Two are worked portions of thin tubular bones; one has a perforation in it and the other has been grooved or cut in two places. A third artifact of this group was abandoned before it had been completed. The worker apparently was making an awl or punch.

POTTERY

As has already been indicated, pottery constitutes by far the major part of the cultural material recovered during the excavations. The quantity is so great that the study of it has not been finished. However, the pottery found in two 5-foot squares of the refuse mounds has been macroscopically analyzed and classified, one square from Trench A and the other from Trench B. Each square was excavated in arbitrary 6-inch levels in an attempt to preserve any information which might be of possible temporal significance.

The most numerous type is the culinary ware with indented corrugations on the entire exterior of the vessel. This has been called exuberant corrugated, indented corrugated, and all-over corrugated ware. The majority of the black-on-white pottery is classified as

TABLE 31. A COMPARISON OF THE POTTERY FROM TWO FIVE FOOT SECTIONS (CAHONE RUIN)

Type	*Trench A (Section 180W, 55S)*		*Trench B (Section 170N, 50W)*	
Lino Black-on-gray[a]	1	(0.1)	—	—
Kana'a Gray[b]	—	—	4	(0.8)
Plain Corrugated[c]	20	(2.7)	6	(1.2)
Smooth Culinary (probably Lino Gray or Kana'a Gray)[d]	13	(1.7)	6	(1.2)
Indented-corrugated[e]	387	(51.6)	239	(47.8)
Plain ware (incised or punctate)	—	—	1	(0.2)
Mancos Black-on-white	147	(19.6)	127	(25.4)
McElmo Black-on-white[f]	—	—	1	(0.2)
Other black-on-white	3	(0.4)	3	(0.6)
Indeterminate (white slip but no design showing)	169	(22.5)	104	(20.8)
Abajo Red-on-orange[g]	1	(0.1)	1	(0.2)
Tusayan Black-on-red[h]	1	(0.1)	—	—
Indeterminate red (no design showing)	6	(0.8)	7	(1.4)
Brown	1	(0.1)	—	—
Burnished brown	1	(0.1)	1	(0.2)
Totals	750	(100.8)	500	(100.0)

[a] Colton, and Hargrave, 1937, p. 194.
[b] *Ibid.*, p. 195.
[c] Martin, Lloyd, and Spoehr, 1938, p. 268.
[d] *Ibid.*, p. 270.
[e] *Ibid.*, p. 270, and Pls. CLXXVI–CLXXVIII.
[f] Martin, Roys and von Bonin, 1936, several plates; formerly called "Proto-Mesa Verde," Kidder, 1924, p. 67
[g] Brew, 1946, p. 254.
[h] Colton and Hargrave, 1937, p. 74.

Mancos Black-on-white.[10] The remaining sherds are of both culinary and slipped wares. Some have been classified, others have not (Table 31).

A study of Table 31 reveals no great difference between the sections. This has been interpreted as an indication that each trash mound (Trenches A and B) was deposited at approximately the same time.

Some other pottery types were found elsewhere in the site. They occurred in small percentages only and were rather evenly distributed between the upper and lower levels of the trash mounds. These other pottery types are:

Lino Gray[11]
Red Mesa Black-on-white[12]
Tusayan Polychrome[13]
Citadel Polychrome[14]

Additional sherds, not yet identified as to type, were also found in the refuse. One variety is recognized by an indented-corrugated exterior and black-on-white interior. The vessels treated in this manner were bowls. A second variety is indented-corrugated ware with rectilinear incising across the coils. A further modification of an indented-corrugated exterior is that called finger-line because of the broad lines (5 to 8 mm.) which pass obliquely over the indented coils. The so-called basket-molded sherds also appear. The number of sherds exhibiting these variations is small in relation to the indented-corrugated and black-on-white wares.

Before leaving the pottery it should be noted that there are several worked sherds. These sherds, which have ground edges indicating use after they became sherds, are of both the black-on-white and red wares. Most were probably used as pot-scrapers. At least one may have worn as an ornament. It is almost square in shape (9×8 cm.) and has rounded corners. A biconical perforation appears near one corner of the sherd.

CONJECTURES

The Cahone Ruin was constructed in accordance with a preconceived plan. The evidence recovered indicates that the several occupation units were inhabited at approximately the same time. Perhaps several families of similar heritage decided to live in this area, but still wished to remain relatively by themselves. This would account for the similarity in house construction, the location of the kiva and refuse with respect to the house, the pottery, and other cultural material.

We know that the building of small houses close together in a community is not unique. In 1918, Prudden commented that the unit type ruins in the northern San Juan district are "more often in community groups upon favorable sites."[15] Perhaps the people gathered here to build a religious or social center. The circular depression in the center of the D-shaped village tends to support this theory.

A consideration of the cultural and temporal position of this ruin is desirable.[16] Pottery is one of the most frequently used criteria for this purpose. It has been noted that our major types are Mancos Black-on-white and indented-corrugated. For the purposes of this discussion it seems reasonable to include the indeterminate or white slipped pottery with no design as Mancos Black-on-white. Other sites containing these two types in a majority are described in the Ackmen-Lowry report[17] and the Lowry Ruin report.[18]

Dr. John Rinaldo of the Chicago Natural History Museum has been working on a seriation chart of the pottery from this general area, using data taken from the material in the Chicago museum. When he had completed this, he took the sherd counts and percentages for the two sections discussed in this paper and worked them into his chart. They were found partially to fill a gap which then existed between Site 2 of the Ackmen-Lowry report and the Lowry Ruin. Site 2 has been culturally placed as early Pueblo II,[19] while the Lowry Ruin, although occupied and reoccupied over a period of time, was placed culturally as late Pueblo II-early Pueblo III.[20] This allows us to postulate that the Cahone Ruin was occupied during the Pueblo II cultural period.

Before accepting this, let us review the nature of the cultural evidence other than pottery. Architecturally, we found that this ruin con-

[10] Martin, Roys and von Bonin, 1936, pp. 80–94.
[11] Colton and Hargrave, 1937, pp. 191–2.
[12] Gladwin, 1945, p. 56.
[13] Colton and Hargrave, 1937, pp. 96–7.
[14] *Ibid.*, pp. 75–6.
[15] Prudden, 1918, p. 47.
[16] The Pecos Classification will be employed throughout this discussion.
[17] Martin, Lloyd, and Spoehr, 1938.
[18] Martin, Roys, and von Bonin, 1936.
[19] Martin, Lloyd, and Spoehr, 1938, p. 294.
[20] Martin, Roys, and von Bonin, 1936, p. 204.

sisted of several small houses. This indicates that the ruin is Pueblo II or III.[21]

The bone artifacts present an interesting problem. It will be recalled that scrapers of both the splinter and humerus types were recovered. In fact, both types had some relation to the same burial in Trench A. Brew, in discussing bone scrapers or fleshers, states that the humerus type came into the Alkali Ridge area (40 miles west of Cahone) at the approximate time of early Pueblo II.[22] Morris in reporting on his work in an area east of the Cahone Ruin states that the humerus type is a trait of Pueblo III times.[23] This causes some confusion, but does lead to the conclusion that the bone scrapers recovered at the Cahone Ruin indicate a cultural position in Pueblo II or Pueblo III.

The stone artifacts present a similarily confused picture. The projectile points with straight stems are characteristically Basket Maker III and Pueblo I. The triangular side-notched points are characteristically Pueblo III. However, at the Cahone Ruin both classes were found intermixed in the same level.

On the basis, then, of pottery, architecture, stone, and some bone artifacts we can state that the Cahone Ruin represents a stage of culture in the Southwest which under the Pecos Classification would be called Pueblo II or III. The cultural sample suggests a transitional stage between Pueblo I and Pueblo III, which would lead one to place it in Pueblo II. I would tend to consider it a little closer to Pueblo III than to Pueblo I. The preservation of the small house type of dwelling in an expanded community indicates that this type had become well integrated into the culture. If it were not so well integrated another type of structure would probably have been developed. Also, there are more triangular, side-notched points in the collection than there are triangular, straight-stemmed points, and this indicates that the former type had come into vogue.

What is the temporal position of this manifestation? In the absence of tree ring dates, we have to rely on the dates of similar cultural manifestations. If the pottery seriation chart of Rinaldo's is accepted, it can be concluded that the Cahone Ruin was occupied around 1000 A.D., on the basis of the dates given for Site 2 in the Ackmen-Lowry area and the Lowry Ruin, which are around 900 A.D.[24] and 1000–1100 A.D.[25] respectively. It should be emphasized that this only an approximate date.

[21] Brew, 1946, pp. 224–5.
[22] *Ibid.*, p. 242.
[23] Morris, 1939, p. 122.
[24] Martin, Lloyd, and Spoehr, 1938, p. 294.
[25] Martin, Roys, and von Bonin, 1936, p. 204.

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University of Michigan
Ann Arbor, Michigan
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FACTS AND COMMENTS

METHODS OF FELLING TREES AND TREE-RING DATING IN THE SOUTHWEST

A dead trunk, seasoned hard, is extremely resistant to the blows of a stone axe and fairly unyielding to a keen axe of steel. A high percentage of wood specimens from ruins in the Southwestern United States which furnish outer ring dates before A.D. 600, are parts of trees that were dead before they were felled; they are often weathered, and sometimes show signs of having been attacked by secondary insect pests.[1]

Beams from the earliest dated ruins in the Southwest appear to have been felled and trimmed by burning and breaking:

Cave du Pont, near Kanab, south central Utah, *217*, broken.[2]
Mummy Cave, Canyon de Chelley National Monument, northeastern Arizona, *292* to 483+, burned.[3]
Obelisk Cave, near Red Rock, northeastern Arizona, *438* to *491*, burned and broken.[4]

A limber, growing tree is harder to fell by burning or breaking than a dry, brittle, dead trunk. The softer wood of growing trees was appreciated by the stone axe men; most of the well preserved wood specimens furnishing outer ring dates in the 600's or later bear larger chopping scars than could have been made on a dead trunk.

Stone axes, with grooves or side notches for hafting, have been found in the following comparatively early dated ruins in the Southwest:

Site 33, Wimanuchi Ute Reservation, southwestern Colorado, 692+ to 831+.[5]
Site 2, Ackmen-Lowry area, southwestern Colorado, 736+ to 768+.[6]
White Mound, near Houck, east central Arizona, *757* to *801*.[7]
Site 13, Alkali Ridge, southeastern Utah, *771* to *777*.[8]
Group C-3, Piedra River, southwestern Colorado, 774.[9]

Hewn logs, evidence that a stone axe was known and used, have been found in additional relatively old ruins in the Southwest (all of the hewn specimens furnishing the cited dates are in the Gila Pueblo Wood Library):

Step House, Mesa Verde National Park, southwestern Colorado, 608+.[10]
Broken Flute Cave, near Red Rock, northeastern Arizona, *620* to *625*.[11]
Mummy Cave, Canyon de Chelley National Monument, northeastern Arizona, *666*.[12]
Tseyatso, Canyon de Chelley National Monument, northeastern Arizona, *712*.

More confirmatory evidence could be presented, but the above is sufficient to permit an assumption: the stone axe was first known and used about A.D. 600 in the northern half of the Basket Maker-Pueblo area of the Southwest.

Dr. Edmund Schulman, who has studied intensively tree growth records from southern Canada to northern Mexico, states:[13]

> The chronology in living trees might conceivably be extended backwards in time by the record in standing dead trees. Only one such tree at Mesa Verde, a promising Douglas fir, was examined, in late August, 1945. This tree grew, with its roots along cracks, on a bare ledge . . . . It was about ten feet high and some ten inches in lower stem diameter; all branches had been eroded from the strongly spiralled stem. Toppled with some effort, sectioned, and dated, it proved to be only 350 years in age, about half that of the oldest living firs at Mesa Verde. But it had died in A.D. 1819 and was still well braced 126 years later.

This log would have been very useful to a man without an axe.

Wood specimens from Square Tower House, a cliff dwelling on Mesa Verde, have furnished many long and reliable records. In September, 1948, I collected additional samples from this site for the Gila Pueblo Wood Library. One core is from a Douglas Fir beam, the central roof support of one of the two partially covered kivas. This specimen (cat. no. 6840), which has a very clear and sensitive and fairly long record, dates with a good correlation at 1740+.

Correspondence with Mr. Don Watson, Mesa Verde Park Naturalist, explained the late date. Mr. Earl Morris and Mr. Al Lancaster had done some needed stabilization work in the ruin in 1934. They secured the log in question from a grove of firs growing below Sun Point.[14] It was sound, seasoned, and eminently usable as a construction timber almost 200 years after the tree had died.

A date assigned to the outermost ring of a log used in a ruin in the Southwest has been accepted tacitly as the construction date for the particular archaeological site. Obviously this is an inexact practice if the bark ring is not present on the specimen, and it is highly questionable even if the bark ring is preserved.[15] The bark ring date establishes the year of the death of the tree; the beam from the tree could not have been used prior to that date.

I offer the following suggestions regarding the interpretation of the tree-ring dates for ruins in the Southwest:

1. The tree-ring date precedes the date of use of the construction log, firewood, or artifact by a year or two at least, conceivably by 200 years in extreme cases. However, series of bark dates (or even plus dates) from a single structure or site may indicate the probable construction date within a few years.

2. Dates for outermost or bark rings that antedate the seventh century are much poorer evidence regarding the use of the wood than dates that fall in or after the seventh century. Before A.D. 600 the stone axe was unknown; dead,

[1] Stallings, 1941, p. 4.
[2] Nusbaum, 1922, Pls. 13 and 14, 17 and 18. Italics signify that the bark date was present.
[3] Two specimens in the Gila Pueblo Wood Library. The plus sign following the date signifies that the bark ring could not be identified.
[4] Gila Pueblo Wood Library records for sixteen specimens. Douglass (1938, p. 12) lists seven specimens: 477–488.
[5] Morris, 1939, pp. 80 and 84.
[6] Getty, 1939, p. 495. One out-of-sequence date of 612+ is intentionally omitted from the series.
[7] Gladwin, 1945, p. 29.
[8] Brew, 1946, p. 90.
[9] Haury, 1938, p. 3. It is uncertain whether or not this is a bark date.
[10] Douglass (1938, p. 12) lists one specimen: 625.
[11] *Idem* lists eight specimens: 354+ to 647.
[12] *Idem* lists twenty-eight specimens: 348–666.
[13] Schulman, 1946, p. 23.
[14] An illustration of this grove of firs is contained in Douglass (1939, p. 11); it is the "Typical Site of Trees Producing the Best Crossdating."
[15] Today we do not use logs as roof rafters the year in which they are cut, dripping pitch, and limber through being unseasoned. The Indians of Pueblo Bonito and Cliff Palace probably were equally sensible.

seasoned logs were collected and used. After 600 it is probable that the life of the tree was ended by an axe, and the axeman used the material himself.

3. A "re-used beam," a term sometimes employed to explain the presence of a log yielding an out-of-place early date in a series of dates for a particular structure or site, may have been taken from an abandoned neighboring dwelling. But it is just as possible that a suitable dead log was used with a number of axe-cut timbers. This reasoning explains easily the inconsistent date of 612+[16] in the eleven specimen sequence of 736+ to 768+ for Site 2, Ackmen-Lowry area, without begging the question that there are earlier ruins in the immediate vicinity.

4. The find of unfired sherds of a clay vessel in Cave du Pont[17] is more compatible with the stage of culture in the Southwest in the 300's and 400's than at the assigned tree-ring date of *217*. If we assume the sherds to represent an initial reaction to stimulus diffusion, it might be futile to search adjoining regions for the source of the diffused idea at too early a date.

The possibility that early ruins may have been occupied much later than associated tree-ring dates imply is of great importance. There is an astonishing scarcity of dates in the 500's in the Southwest. Probably wood was cut and used reasonably quickly after A.D. 600 (accounting for the numerous dates for the seventh century, and on to modern times). In the 500's, the early inhabitants of the Southwest were using dead trunks for construction beams—trees which had died in the 400's. The Obelisk Cave dwellers may have lived in the 500's; the Falls Creek Basket Makers of southwestern Colorado may have constructed their homes as late as the 300's and 400's;[18] Cave du Pont may have been occupied in the 300's; and so on.

This possible interval between tree-ring dates and the actual dates of construction, this gap which probably was appreciable before A.D. 600 and negligible after 600, should be considered in all comparisons and affiliations attempted between cultural levels in the Southwest and cultural levels found elsewhere in North America.

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Deric O'Bryan
Gila Pueblo
Globe, Arizona
March, 1949

[16] Getty, 1939, p. 495.

[17] Nusbaum, 1922, Fig. 34.

[18] Morris and Schulman released a bark date of 203 for a low occupation level in the site: Point of Pines Conference, August, 1948.

EARLY CENTRAL CALIFORNIAN AND ANASAZI SHELL ARTIFACT TYPES

In his recently published paper on "The Archaeology of Central California I: The Early Horizon,"[1] Robert F. Heizer writes "it is possible to anticipate at least in the later Southwestern horizons, for which we have dendrochronologic dates, a direct cross-chronology between the Southwest and California in terms of actual year dates."[2]

Fourteen Californian shell types from Anasazi sites, ranging from Basketmaker II to Pueblo IV, have been listed.[3] Nine of these fourteen types come from Basketmaker III sites, one also from Basketmaker II, indicating that they were already being made in California contemporaneously and probably considerably earlier. These Basketmaker examples thus establish a minimum dating for the types in California.

The purpose of this note is to consider the occurrence of the Anasazi-Californian shell types in three of Heizer's Early Horizon sites of Central California, designated as C-68, C-107, C-142. Table 32 gives the number of types occurring in these sites and in Anasazi sites[4] according to period. It indicates that transmission of Californian shell-artifact types to Anasazi settlements was strongest in Basketmaker III times. This implies that the types had probably long been manufactured in California, a statement also substantiated by the wide distribution of the types concerned in California itself. This supports the views of Heizer for a considerable antiquity for his Early Horizon. (See also Californian species in the list of Peabody Museum specimens tabulated with dates by Donald B. Tower.[5])

The Californian-Anasazi types occurring in the three Early Horizon sites are given in Table 33.

Although not concerned with the subject of this note,

[1] Heizer, 1949.

[2] *Ibid.*, p. 36.

[3] Gifford, 1947, p. 61.

[4] For details as to Anasazi sites, see Gifford, 1947, p. 61.

[5] Tower, 1945, pp. 20, 21.

TABLE 32. OCCURRENCE OF ANASAZI-CALIFORNIAN SHELL TYPES IN EARLY HORIZON SITES OF CENTRAL CALIFORNIA

	BM II	*BM III*	*P II*	*P III*
Site C-68 (4 types)		3	2	2
Site C-142 (4 types)		4		1
Site C-107 lower (5 types)	1	5	1	1
Site C-107 upper (6 types)		6	1	1

TABLE 33. CALIFORNIAN-ANASAZI TYPES IN THE THREE EARLY HORIZON SITES*

Types	*Site C-68*	*Site C-142*	*Site C-107, lower*	*Site C-107, upper*
G1a (*Olivella biplicata*)	×			×
J2aI (*Haliotis cracherodii*)		×	×	×
J2aIV (*Haliotis*)			×	
K2aIII (*Haliotis*)	×			
Q1aIV (*Haliotis*)	×		×	
S2aIII (*Haliotis*)	×	×	×	×
V1aII (*Saxidomus nuttalli*)				×
X2b (*Olivella biplicata*)		×		×
X3bI (*Olivella biplicata*)		×	×	×

* For description and distribution of the types, see Gifford, 1947.

yet nevertheless with the matter of cross-dating, is the horned muller pictured by A. V. Kidder in his *Artifacts of Pecos*.[6] He attributes this to Pueblo IV, Glaze V period. The specimen appears to be the type of muller used by the Klamath Lake Indians of southern Oregon. This Pecos specimen therefore establishes a minimum date for the type in its homeland. J. A. Jeancon pictures another from the Chama Valley, New Mexico.[7]

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E. W. GIFFORD
University of California
Berkeley, California
June, 1949

[6] Kidder, 1932, Fig. 75, p. 99.
[7] Jeancon, 1923, Pl. 59.

A COPPER TRADE OBJECT FROM THE HEADWATERS LAKES ASPECT IN MANITOBA

The spread of the Headwaters Lakes Aspect in a northwesterly direction through Manitoba, has been the subject of previous comment by the senior author.[1] The manifestations of the aspect in this area, have a marked resemblance to the Black Duck Focus, and have been defined as the Manitoba Focus.[2]

The factual data upon which this conclusion is based are derived from three controlled excavations in Manitoba. Hecker and Hlady excavated the Lockport site, north of the city of Winnipeg, in August, 1947. Hecker reports the presence of sherds that show a "close relationship" to the Black Duck Focus.[3] During 1947 and 1948 the junior author conducted excavations on the Scott site near Brandon, Manitoba.[4] This site is located on the S.W. Sec. 35, T. 10, R. 20, W. 1, and has yielded a good collection of Manitoba Focus sherds, with an associated artifact complex that closely corresponds to that outlined by Wilford for the Headwaters Lakes Aspect.[5] Finally the senior author has excavated on the Avery site (S.W. Sec. 14, T. 3, R. 13, W. 1), during the past four years.[6] This work has recovered a vast amount of material that closely resembles that found by Wilford on Headwaters Lakes sites in Minnesota. The Avery site material is sufficient

[1] Vickers, 1947*a*, pp. 109–14; Vickers, 1948*a*, pp. 8–11.
[2] Vickers, 1948*a*, p. 8; Vickers, 1948*b*, pp. 15–16.
[3] Hecker, 1947, p. 1.
[4] Bird, 1947.
[5] Wilford, 1943, pp. 100–1.
[6] Vickers, 1945, 1946, 1947*b*, 1948*b*.

to establish the presence of the aspect in Manitoba. The widespread geographical distribution of the culture over the province justifies the selection of the local name, Manitoba Focus.

Wilford has suggested that the Headwaters Lakes Aspect in Minnesota "most likely" represents the cultural remains of the prehistoric Assiniboine Indians.[7] With this assumption the writers agree. The Canadian evidence, previously reviewed by the senior author, strongly supports the Wilford hypothesis and need not be repeated here.[8] The problem of dating the aspect has been approached with equal caution. Wilford confines his ideas to

FIG. 52. Tubular copper bead from the Stott site, Manitoba (cat. no. 393; photograph by R. D. Bird).

the following, "The Headwaters Lakes culture has in general an appearance of being relatively late."[9] This appears to be confirmed by historical and archaeological evidence in Manitoba.

The historic approach to the subject of Assiniboine occupation of Manitoba was the theme of an earlier paper by the senior author.[10] Data presented at that time were summarized in these words, " . . . the writer suggests that the Headwaters Lakes aspect manifestations in southern Manitoba, could have been the work of the Assiniboine during the years circa 1600 to 1650 [A.D.]."[11] In the archaeological field, any attempt at even approximate dating, prior to the subject of the present paper, was based on impressions. These, however, were of sufficient weight to indicate a late date for occupation of the sites studied. On the Avery site, hearth sites yielded fragments of Bur Oak (*Quercus macrocarpa*) in an excellent state of preservation. The bone refuse present is also well preserved. These factors, minor as they appear to be, support Wilford's assumption of a late date for the aspect, and bolster the somewhat slender historical evidence.

Speculation on dating the aspect was materially strengthened during the 1947 field season. The junior author, while excavating on the Stott site, recovered from test pit No. 2, on October 27, 1947 the tubular copper bead illustrated as Figure 52.[12] On the Stott site the overburden has an average depth of 16 inches; the occupational deposit an average depth of 12 inches; the copper bead was removed from the vertical center of the occupational strata. This object is made from a thin sheet of copper, rolled to form a tubular bead. It is 67.2 mm. long and 6.4 mm. at its point of greatest width. In defining it as a tubular copper bead, we have adopted the nomenclature of McKern, who illustrates similar native objects from the Upper Mississippi Phase in Wisconsin.[13]

In the beginning the bead was considered to be of native origin. Careful re-examination of the specimen in May, 1948, however, strongly suggested that it was a trade object acquired from the white man. In order to test the accuracy of the new deduction, the bead was forwarded to Dr. Douglas Leechman of the National Museum, Ottawa, during October, 1948, for further examination and testing. The result of this further testing is set forth in Leechman's letter of November 2, 1948, addressed to the junior author.

> I am returning under separate cover by registered mail the copper ornament which you sent me for examination. About an eighth of an inch has been nipped off one end. This was dissolved in nitric acid and the resulting solution was tested for the presence of silver. There was no clouding or precipitation, indicating that no silver was present. As a check, a minute quantity of very dilute silver chloride was added to the solution and its presence was immediately apparent.
>
> Copper from the Lake Superior region, and, indeed, nearly all native copper in North America, contains a considerable proportion of silver and its absence in your specimen indicates clearly that the copper is of European (?) manufacture. You will notice too that the sheet metal is of uniform thickness and shows no signs of hammering, another indication of its non-aboriginal origin.

The significance of this discovery is immediately apparent. It is the first authentic trade object to come from a ceramic period site in Manitoba;[14] and its association with the Manitoba Focus material on the Stott site, furnishes an opportunity for much more accurate dating of the Headwaters Lakes Aspect than was hitherto possible. The fact that it is the lone example of trade goods so far discovered in the culture, suggests that it was acquired early in the period of possible contact. If it had been acquired after the establishment of permanent trading posts on the coast of Hudson Bay, it seems reasonable to assume that trade goods would be more plentiful on the Stott and other Manitoba Focus sites. As it was not until 1682 that permanent trading posts were established on the west coast of Hudson Bay, the writers assume the copper bead was likely obtained before that date, either on Hudson Bay or in the Lake Superior region. A brief evaluation of possible sources and their dates follow.

Dealing with the southeastern extremity of Hudson Bay first (James Bay), we find that Henry Hudson, who discovered the great inland sea in 1610, apparently camped near the mouth of Rupert River during the winter of 1610–11.[15] Thomas James spent the winter of 1631–32 on Charl-

[7] Wilford, 1945, p. 328.
[8] Vickers, 1947*a*, 1948*a*.
[9] Wilford, 1945, p. 327.
[10] Vickers, 1948*a*.
[11] Vickers, 1948*a*, p. 11.
[12] Bird, 1947, p. 6, Pl. 3.
[13] McKern, 1945, Pl. 44.
[14] A trade bead, now in the Manitoba Museum, Winnipeg, is reported to have been found in or on the Weibe Mound, Morden, Manitoba. Rand, who excavated the mound, does not mention it in the only published account (Rand, 1945, pp. 3–4). Conversation with some of Rand's assistants suggest the bead was found on or near the surface, and not connected with any burial.
[15] Burpee, 1940, p. 406.

ton Island in James Bay. James did not see a single native during his voyage around Hudson Bay. This, combined with the 30 miles of the stormy waters of James Bay, that lie between his camp and the mainland, do not suggest that his voyage was a likely source of trade goods.[16] Finally, Des Groseilliers established Charles Fort at the mouth of Rupert River for the Hudson's Bay Company in 1668.[17] While these recorded sources from the James Bay area are not impossible, they are very unlikely, for the simple reason that communication between southern Manitoba and James Bay is a difficulty and hazardous task for any traveller ancient or modern.

The west coast of Hudson Bay appears to provide a better source of early contact goods. Travel to and from the Bay was possible for the aborigines of southern Manitoba, by way of the Hayes or Nelson rivers from Lake Winnipeg. Thomas Button was at the mouth of the Nelson River during the winter of 1612–13. He appears to have wintered on board his ship.[18] There is, however, ample evidence that he spent considerable time on shore. Luke Foxe, who spent some time at the mouth of the Nelson in 1631, records a long list of relics left by Button.[19] Jens Munck, the Danish navigator, spent the winter of 1619–20 at the mouth of the Churchill River. He did not see any natives, but there is evidence that northern tribes visited his abandoned camp. They found iron and nails and the corpses of 63 of his 67 crew members who had perished during a fearful winter.[20]

These early journeys do not appear to have been made for the purpose of trade; they were primary journeys of exploration. With the arrival of Radisson at the mouth of the Nelson in August and September, 1670 this was changed. He did not establish a post, apparently did not see any Indians, but likely left some goods as he found evidence of recent occupation of the area by the Indians.[21] Des Groseilliers visited the mouth of the Nelson in 1673. Once again these hardy pioneers of the fur trade missed the Indians, but left some goods to encourage their return.[22] Finally in 1682, Radisson and Des Groseilliers, Zechariah, and Benjamin Gillam established three posts at the mouths of the Hayes and Nelson rivers.[23]

From some of the sources listed in the two preceding paragraphs, the copper bead could have found its way to the Stott site. It does not seem likely, however, that it occurred after 1682, for there is good evidence that, following the establishment of permanent posts in the Port Nelson area, the Assiniboine were frequent visitors on Hudson Bay. Morton, in a summary of the record of the French historian La Potherie for the year 1684, when the French were in command at Port Nelson, states, "Assiniboins brought down a beautiful body of furs in ninety-one canoes."[24] This suggests trade goods in an abundance not evident on any Manitoba Focus site so far explored in the province, and almost compels the assumption that the Stott site was occupied and abandoned prior to 1682.

There is also evidence that the Assiniboine had contact with French traders from Quebec in the Lake Superior region. In 1679 Du Lhut met the Assiniboine " . . . at the head of Lake Superior."[25] The distinguished American historian, Grace Lee Nute, has recently added an interesting fact to the chain of evidence. Reviewing the Radisson Journals for 1682, 1683, and 1684, Nute reveals that Assiniboine Indians visited the French post at the mouth of Hayes River in the spring of 1683. In addition the Assiniboine chief was anxious to meet Radisson, and recalled presents received from Radisson many years before. This could only have been in 1660 when Radisson was trading with the western Indians somewhere in the Lake Superior area.[26]

This eastern source has a strong flavor of probability. It was a well known early range of the Assiniboine tribe.[27] The tubular copper bead even suggests a trader with some knowledge of native copper beads of the Eastern Woodlands. McKern has furnished us with proof that the prehistoric Indians of Wisconsin did make tubular beads of native copper.[28] The trade bead is so similar in outline and detail as to suggest that it could have been made to fill a native want. Radisson and other early traders knew these wants.

An earlier, perhaps more easterly origin, for the subject of this paper has not been considered. It is not impossible, but to so conclude appears to be stretching the thread of probability dangerously thin. Even those who care to wander further afield will find it does not materially alter possible dating. Speculation on the exact source of the trade copper bead is not the present purpose. Woodward, in a personal letter to the junior author, has clearly stated the opinion of the writers " . . . the task of pinning it down with any degree of finality is most remote."[29] The real object is to emphasize the presence of trade copper on a Headwaters Lakes Aspect site in Manitoba, and to put on record the importance of that fact for Northern Plains chronology.

With this in mind, it appears to be a safe assumption that this tubular copper bead had a seventeenth century origin and was probably acquired sometime between the years 1610 and 1682, from either the Hudson Bay or Lake Superior areas. This would be after Henry Hudson's discovery of the great bay, very likely prior to the establishment of continuous trade relationships with the Assiniboine of Manitoba in 1682. Coming from the center of the occupational deposits on the Stott site, it appears to date the occupancy of that site, and will serve as a bench mark for further time reckoning of all the ceramic horizons of the Northern Plains. It supports the hypotheses that the Headwaters Lakes culture represents the work of the prehistoric and protohistoric Assiniboine, and confirms

[16] Morton, n.d., p. 34.
[17] Morton, n.d., p. 50.
[18] Ellis, 1748, p. 35.
[19] Burpee, 1908, pp. 53–4.
[20] Morton, n.d., pp. 31–3.
[21] Nute, 1943, p. 136.
[22] Nute, 1943, p. 142.
[23] Nute, 1943, pp. 186–97.
[24] Morton, n.d., p. 97.
[25] Parkman, 1901, p. 257.
[26] Nute, 1943, p. 224.
[27] Vickers, 1948a, pp. 8–11.
[28] McKern, 1945, Pl. 44.
[29] Arthur Woodward, Los Angeles County Museum.

FIG. 53. Shell collar, Puerto Rico: *Top*, front view; central scallop shows a longitudinal line where there was a fracture. *Bottom*, back view, with slight inclination to show the central panel more distinctly. One-half size.

the previous assumption, that the manifestations of the aspect in Manitoba were probably the work of the Assiniboine during the first half of the seventeenth century.

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CHRIS VICKERS
Historical Society of Manitoba
Baldur, Manitoba

RALPH D. BIRD
Entomological Laboratory
Brandon, Manitoba

February, 1949

A SHELL COLLAR FROM PUERTO RICO

While the stone collars of Puerto Rico are well known,[1]

[1] E.g., J. Walter Fewkes, "The Aborigines of Porto Rico and Neighboring Islands," *Annual Report of the Bureau of American Ethnology*, No. 25 (1903–04), Washington, 1907, pp. 159–72.

none has been reported of other materials. The writer, however, has in his collection a collar of shell in the shape of a slender stone collar. It has been made out of the top portion of one of the so-called giant conch shells, so common in this island. The shell is of the same kind as those from which shell cups were constructed.

The specimen measures 7¼ inches in height and 5¼ inches in its greater width. Its thickness varies from 1 inch to nearly ¼ inch, being thicker at the junction of the shoulder and the decorated panel, where the arch is almost round. It is pear-shaped in its general outline, with the central opening, also of pear shape, surrounded by an almost flat band, an inch wide, which forms the shoulder and the decorated and undecorated panels above it (Fig. 53).

Two prominences, a projection and a shoulder ridge, are situated in the central part of the left shoulder blade, inclining towards the outer and lower portion of it, opposite the decorated panel, and about an inch below the undecorated panel. The projection measures 1¼ inches in length.

The undecorated panel does not have a central pit, as is usual with the stone collars, but instead an oblong-shaped space in its center, decorated in low relief, similar to a medieval French shield, with crossed lines forming diamond shaped spaces, each containing a small round pit. The decorated panel presents a scalloped border at its outer edge, with a perforation in each of the five scallops. A trapezoid-shaped geometrical figure in low relief occupies the center of this panel, from the top, where the boss is, to the bottom. The inner border has no decoration at all.

The boss is formed at the top by part of the decorated panel and below, by a deep furrow between this and the undecorated panel. The two panels are united by a thick band of shell beginning at the upper inner part of the decorated panel and ending in a band at the middle of the undecorated panel.

Unlike the stone collars, the inner surfaces of both panels are concave or hollowed out, although several projections—natural in the conch—serve as ornamentation to both parts.

This specimen was found in a shell heap near the Río Duey on the farm of Don Onofre Torres in Barrio Diego Hernández, Yauco, Puerto Rico. Several boys picked it out of a small ditch after a rain and handed it to Don César Fermoso, from whom the writer bought it many years ago.

It is my opinion that this site was the headquarters of Agueíbana, principal chief of the Borinquen Indians. Many elaborate stone artifacts have been found there, including two or more stone collars, several *zemis*, and many amulets.

J. L. Montalvo Guenard
Santurce, Puerto Rico
February, 1949

MARTIÑEZ DE COMPAÑON, FOUNDER OF PERUVIAN ARCHAEOLOGY

Baltasar Jaime Martiñez de Compañon, has been mentioned in anthropological literature for the past fifty years, albeit rather sporadically; but up to the present time the importance of his legacy has not been appreciated by those anthropologists in the Peruvian field, especially those who have dealt with the ethnology and archaeology of the North Coast. Although one of the purposes of this brief note is to call attention to the necessity of incorporating the valuable illustrative material of Martiñez de Compañon in future works, the primary purpose is to make known to the anthropological public that, except for an extremely rare edition of plates which is but a tiny fraction of the whole, the enormous fount of ethnological and archaeological information that Martiñez left remains unpublished.[1]

The rough chronology of the famous archbishop's curriculum vitae is as follows: He was born in Cabredo, Spain about 1735; studied philosophy in the Convento de la Merced of Calatayud, and later law and canon in the Universities of Oñate and Huesca, whence he obtained the three grades of Canon. He was ordained priest in 1761. Continuing to gain prominence by his rapid rise in the religious heirarchy, he attracted the attention of the king, Charles the Third, who in the year 1767 proposed Martiñez for the post of Chantre of the Cathedral in Lima, a position which he proceeded to occupy the following year. His career continued brilliantly in Lima, where he held offices of importance, the most significant of which was First Secretary of the Lima Council in 1773. As a reward and a further challenge to the abilities which he displayed in his rapid rise, Martiñez de Compañon was appointed bishop of Trujillo by the king. He took office on May 13, 1779.[2]

A rough résumé of his activities as bishop is imposing: He founded 20 villages; changed the location of 17 others; constructed 54 schools, 6 seminaries, 4 houses of education for Indians, and 39 churches; constructed 6 new roads and 3 major irrigation canals; sponsored the planting of various new and economically important plants; and inaugurated a campaign of reforestation. In addition he effected a major reconstruction of the Cathedral.

Most important of all his labors was his pastoral visit, which took place between the years 1782 and 1789 and proved to be the most thorough tour of investigation ever accomplished by a cleric in Peru. At that time the bishopric of Trujillo included all of the north coast from Tumbez to Santa, all of the north sierra down to the Callejon de Huaylas and a huge slice of the montaña (in Means' words—the northern third of the present Republic of Peru). Martiñez traveled over this entire territory, not only as chief administrator of the church, but as a zealous

[1] *Trujillo del Peru a Fines del Siglo XVIII*, edited by Don Jesús Domínguez Bordona, Madrid, 1936. This volume consists of 208 reproductions of the possible 1,411 in the collection at the Biblioteca del Palacio Real in Madrid, as well as an introduction by Bordona and a catalogue of the entire collection of drawings. The extreme rarity of this work is attested by Means, who in 1942 averred that he was unable to find the work in this country.

[2] The data on the life of Martiñez were summed up from the introduction of Domínguez Bordona in the work cited above. The only reference to the famous prelate in English is: Phillip Ainsworth Means, "A Great Prelate and Archeologist," in *Hispanic American Essays in Commemoration of James Alexander Robertson*, edited by A. Curtis Wilgus, Chapel Hill, 1942.

FIG. 54. Reproduction of Martiñez' Plate LXXXIX, illustrating Peruvian burials.

investigator in the realms of the natural and social sciences. He returned with an encyclopaedic account of the Peru of his day, replete with water-color illustrations of all that he had been able to observe. In his remaining years in Trujillo he organized a collection of water-color illustrations to the number of 1,411, which he sent to Charles the Third. The index to the collection lists nine distinct volumes: Vol. 1 includes maps and portraits of personages; Vol. 2, plans of churches, buildings, census tables, vocabulary lists, customs, and folklore; Vol. 3 is devoted to trees and Vol. 4 to fruit trees; Vol. 5, medicinal herbs; Vol. 6, quadrupeds; Vol. 7, birds; Vol. 8, crustaceans, shellfish, etc.; and Vol. 9, antiquities.

In 1788 and again in 1790 Martiñez sent two large collections of antiquities to Spain to form part of the newly established "Cabinet of Natural History and of Antiquities" of Charles the Third, which, as far as we know, is the first documented collection of archaeological material from Peru to reach Spain.[3]

In 1791 Martiñez left Trujillo to assume the archbishopric of Sante Fe de Bogotá, where he tried unsuccessfully to edit his voluminous notes in the form of a history of the bishopric of Trujillo. Ill health plagued him in his last few years, and he died in 1797.

Some idea of the importance to Peruvian archaeology of the work of Martiñez Compañon may be gleaned from the index to Volume 9. Among the plans (the first to appear in Peruvian archaeology) are (1) a general sketch map of Chan Chan, (2) a detailed plan of what is now called Grupo Rivero in Chan Chan, (3) a detailed plan of the Huaca del Sol, called by Martiñez, "el Castillo," (4) a plan of Marca Huamachuco, (5) an undescribed ruin called Tantalluc in the province of Cajamarca, (6) a sketch map of part of the Inca highway between Saña and Jequetepeque, (7) a sketch map of the major irrigation canals in the Chicama Valley. Among the objects illustrated are numerous textiles, ceramics, and ornaments of gold, silver, shell, and wood in the Mochica and Chimu styles, all of which are rather faithfully reproduced.

Martiñez was perhaps most fastidious in the reproductions of burials, as can be seen in the accompanying illustration (Fig. 54). With the exception of the data on the general orientation of the tombs, there is little that modern archaeology could add to his illustrations. Unfortunately, the key to the small letters in the drawing has not yet been found. Nor, as can be readily seen here, did Martiñez lack a notion of interpreting his material. He presented the burials in a succession, corresponding to the status in the society which he supposed the distinct personages must have occupied.

Up to this point mention has been made only of the nine volumes of plates which exist in the Biblioteca del

[3] Although one of the collections arrived in Madrid, it appears that the other or a portion thereof wound up in the Musée d'Ethnographie du Trocadero in Paris, according to information received from Dr. Henri Reichlen. The reason for the mistake was that the same boat that carried Martiñez' material was also carrying a collection of antiquities of the French scientist Dombet. This bark was captured and had to be ransomed. In the ensuing difficulties, the collections were sent to the wrong addresses.

Palacio Real in Madrid. We now know that the bishop sent out questionnaires with eighteen principal questions to all of the parishes before he left on his pastoral visit, to ascertain among other things the number, location, and description of the ruins in each parish. We know also that most of these questionnaires were answered. Some copies of the answers are still to be found in the parish archives. Quite possibly the bulk of the data was filed away with Martiñez' unedited notes, which are said to be in the National Archives of Bogotá.

The Centro Geográfico de la Libertad with its seat in Trujillo, an organization dedicated to geographical and historical studies, has undertaken the initiative of publishing the entire work of Martiñez de Compañon. Up to the present writing, the support of numerous Peruvian organizations, governmental agencies, and prominent historians has been successfully solicited in getting the campaign under way. The all-important support of the Colombian and Spanish embassies has also been secured. The plan of the publication is by means of subscription. Within a short time, a catalogue of the entire manuscript as well as examples of the numerous maps and illustrations will be published and distributed to all institutions, soliciting their support in this important venture.

RICHARD P. SCHAEDEL
Instituto de Antropología
Universidad Nacional de Trujillo
Trujillo, Peru
January, 1949

THE COCHISE CULTURE *OLIVELLA*

The only marine mollusk listed for 22 samples from beds on Whitewater Creek and San Pedro River is a fragment of *Olivella* identified as *Olivella pedroana* Conrad:[1] "A marine species of the Gulf of California and the Pacific coast from California southward. Only one fragment found. It is possible that this might have been used as an ornament." This specimen is from the lowest or Sulphur Spring stage of the Cochise culture, which has yielded certain extinct mammals.[2]

"The problem of the route of spread [of the Cochise people] is raised by the occurrence with the Sulphur Spring artifacts at Double Adobe (bed *b*, Fig. 12) of a shell fragment of the marine gastropod *Olivella pedroana* Conrad, which postulates that the Chochise people had contact with the west coast."[3]

So far as we know *Olivella pedroana* is not recorded from the Gulf of California, but only from the Pacific Coast between north latitudes 23° and 55°.[4] Therefore, our interest was aroused because of the possible bearing of this specimen on the antiquity of man on the Pacific Coast. If the specimen were really *pedroana*, it would afford indisputable testimony of either human inhabitants or visitors contemporaneous with the Sulphur Spring stage of Cochise culture, which Sayles and Antevs date as more than 10,000 years old.[5]

Director Harold S. Gladwin of Gila Pueblo kindly arranged the loan of the specimen from the Academy of Natural Sciences of Philadelphia, where it had been deposited. Comparison of the specimen with our own series of *pedroana* and other species of *Olivella* definitely excluded it from *pedroana*, which has distinctly different sculpturing on the inner lip near the canal. Although the Cochise specimen is fragmentary, the character just mentioned and the outline of the specimen seem to indicate that it is *Olivella dama* Mawe, a common species on the Sonora coast of the Gulf of California.

Professor J. Wyatt Durham, of the Museum of Paleontology, University of California, Dr. Leo G. Hertlein, of the California Academy of Sciences, and Mr. Allyn G. Smith, of Berkeley, all conchologists, have examined the specimen and concur with us in asserting that it is not *Olivella pedroana*, but that it appears to be *Olivella dama*.

Obviously, the Cochise *Olivella* is mute testimony to the effect that the Sonora coast was visited, if not inhabited, in the days of the Sulphur Spring stage.

D. S. AND E. W. GIFFORD
Berkeley, California
April, 1949

[1] E. B. Sayles and Ernst Antevs, "The Cochise Culture," *Medallion Papers*, No. 29, Globe, Arizona, 1941, p. 67.
[2] *Op. cit.*, p. 47.
[3] *Op. cit.*, p. 55.
[4] A. Myra Keen, *An Abridged Check List and Bibliography of West North American Marine Mollusca*, p. 43, Palo Alto: Stanford University Press, 1937.
[5] *Op. cit.*, p. 55.

BOOK REVIEWS

Archéologie du Pacifique-Nord. Matériaux pour l'étude des relations entre les peuples riverains d'Asie et d'Amérique. ANDRÉ LEROI-GOURHAN. Travaux et Mémoires de l'Institut d'Ethnologie, Tome 47. Paris, 1946. xviii+542 pp., 1148 figs., 42 maps. $2.50.

Dr. Leroi-Gourhan's study of the cultural relations of the North Pacific coastal areas of Asia and North America deserves a place alongside the recent and similar attempt at synthesis by Frederica de Laguna.[1] Whereas de Laguna viewed the area from the Yukon Valley, Leroi-Gourhan's approach was by way of Japan and the Ainu area, where he did some excavation, investigated museum and private collections, and utilized published work by Japanese archaeologists in 1938. De Laguna's work consists for the most part of the detailed presentation of the findings of the Yukon expedition; her trait distributions and analyses are in the nature of conclusions. Leroi-Gourhan does not restrict himself to traits noted in one area, to be interpreted by following out their spatial and temporal distributions, but takes up eighteen artifact types or categories, found very widely though not necessarily universally in the North Pacific coastal area. These eighteen "technical themes" are first classified, and then considered distributionally, with as much time perspective as archaeology in the area can at present provide.

Part I is an area-by-area survey of the archaeology of the North Pacific, starting with generalities on Northeastern Asia and North America, and more detailed considerations of Japan, the Ainu area, Kamchatka and the northeast coast of Siberia, the Eskimo, the Aleutians, and the Northwest Coast. Many important American publications were unavailable to Leroi-Gourhan, working in France during the war, and still others, of course, had not appeared at the time his work went to press. Anyone using the work now would have to supplement it with de Laguna's study, mentioned above, Drucker's pioneer northern Northwest Coast archaeological report, the two posthumous works by Hrdlička on Kodiak and the Aleutians, Quimby's papers, Rainey's Okvik and Ipiutak work, the University of California's culture element survey material, and the papers in the symposium on Man in Northeastern America. The chief value of Leroi-Gourhan's work for Americans interested in the North Pacific area would therefore be in his presentation of Japanese and Ainu-area data. The omission of Korean archaeological material, save for a few sparse references, can also be excused; a brief synthesis of the results of Japanese archaeology in Korea by Umehara did not appear until the end of the War. The other lacunae remain unfilled—notably the Siberian coast from Vladivostok north.

Part II deals with the "technical themes"—18 artifact types (the number would be greater if all his sub-types were counted) chosen because, as archaeologically preservable, they can be expected to show some temporal depth. Basketry, canoes, structural features, clothing, and all social, religious, folklore, and other traits are omitted, though their importance is recognized. The "technical themes" are items of culture which are particularly likely to pass from one group to another as trade-goods, or at least they are small and portable. They include: axes and adzes of stone, copper, bronze, and iron, subdivided as to hafting, etc.; the hoe, along with hoe-like implements used in the Arctic for moving snow; the tomahawk (casse-tête); pick; hammer; knife, dagger, and transverse bladed knife (i.e., the ulo and its Eastern Asiatic relative, used, however, for reaping millet and rice); harpoons of all types; pottery and stone vessels; lamps; spoons, cups, pestles, combs, tobacco pipes, and spearthrowers.

The harpoons, expectably, are given most lavish treatment. The tobacco pipe is taken up, despite its recency of diffusion within the area, as an example of the routes of trade, to shed light on pre-white spreads of the other "technical themes."

Although there is a brief mention of Early Man in North America—Folsom and Lindenmeier, the Yuma finds, etc.—Leroi-Gourhan avoids probing into the deep past of Asiatic-American cultural connections. The unraveling of the events of the last two thousand years in the area is the main concern of the book, and even this the author admits is farther than the data now available can take us with any certainty. No origin theory for Eskimo culture is presented, *mirabile dictu*, and no solution for the Ainu enigma either. Explanations for the cultural similarities within the North Pacific area which involve extensive migrations and replacements of peoples are rejected; the author feels that most of the cultural linkages can be adequately explained by exchanges between adjacent peoples along regular routes of trade. His Map 42, and an elaborate table in the appendix, present the evidence for these routes of diffusion, most of them reasonably short and fairly well documented within historic times (e.g., Japanese to Ainu, Chukchi to Eskimo, Haida to mainland). The Bering Strait route is accepted as the only important Asiatic-American crossing, except in very recent times; the Aleutian-Commander Islands route is rejected as beyond the capacity of canoes so far known to have been used in the area. "The relation between Kamchatka and the Aleutians is not a question of lamps and harpoons, but a question of boats."

The concept of the "North Pacific Civilization" is advanced, not, of course, with the same meaning as "European Civilization." The possession of many traits in common, according to Leroi-Gourhan, does not require the assumption of a common culture-hearth, of one region or one people. The idea advanced is more like that of the Indo-European sub-stratum, which cannot be precisely dated or localized but which nevertheless seems to have a basis not only linguistic, but also in folklore and mythology. Leroi-Gourhan's conclusions about the nature of the "North Pacific Civilization" are phrased in much the same way as de Laguna's conclusion about "Eskimo Culture"[2]—that no single group can be hailed as the original Eskimo, nor any

[1] Frederica de Laguna, "The Prehistory of Northern North America as Seen from the Yukon," MEMOIRS OF THE SOCIETY FOR AMERICAN ARCHAEOLOGY, No. 3, 1947.

[2] *Op. cit.*, p. 285.

one restricted area claimed as the home of Eskimo culture.

The principal factors in the cultural situation of the North Pacific, as seen by Leroi-Gourhan, have been the maritime environment, with its emphasis on fishing and sea-mammal hunting, and the determinism of technology, a field which the author had previously explored. The third important element has been diffusion—mainly borrowing of a commercial nature, rather than as a result of massive migrations of culture-carriers.

An item which appeared inexplicable to Leroi-Gourhan in his meticulous study of North Pacific harpoon distributions might be made less mysterious by the reviewer. The socketed ("female") harpoon with four spurs, found in 1884 on San Nicolas Island off Southern California and now in the Musée de l'Homme (Fig. 760, pp. 380–81), of a type known from no nearer than the Bering Sea area, can best be explained by assuming it to be a relic of the brief but intensive sea-hunting by Alaskan natives in the employ of the Russian American Fur Company, who are known to have operated in the area in the early nineteenth century.

GORDON W. HEWES
University of North Dakota
Grand Forks, North Dakota

Reports of the California Archaeological Survey. Berkeley: Department of Anthropology, University of California.

No. 1. The California Archaeological Survey: Establishment, Aims, and Methods. R. F. HEIZER. 1948. vi+2 pp.

No. 2. A Bibliography of Ancient Man in California. R. F. HEIZER. December 28, 1948. 22 pp.

No. 3. Methods of Recording and Present Status of Knowledge concerning Petroglyphs in California. FRANKLIN FENENGA. May 1, 1949. 9 pp., 2 figs.

No. 4. A Bibliography of the Archaeology of California. R. F. HEIZER. June 10, 1949. 27 pp., 2 figs.

With these inexpensively mimeographed *Reports*, the newly established California Archaeological Survey proposes to "make known to the general and scientific public the prehistory of the State of California." The *Reports* appropriately open the attack on a large but unorganized mass of archaeological data, accumulated over more than 90 years, by presenting bibliographic surveys of the published literature on specific subjects and on the field as a whole.

The first *Report* introduces the California Archaeological Survey as a permanent activity of the University of California, with headquarters at the Department of Anthropology, under Robert F. Heizer as Director. The statement of its purposes testifies to the California tradition of comprehensive, long-range planning of research, which has been made familiar to ethnographers in the Culture Element Survey program as reported in the University's *Anthropological Records*, but which has not until now been applied to archaeological problems. The Archaeological Survey (described at greater length in Vol. 14, No. 3, pp. 222–23, Jan., 1949, of this journal) has statewide interests, and will carry on work both with its own staff and through collaboration with other institutions and organizations already active in the state; it will organize a master file of data from all parts of the state; and will publish a variety of materials of archaeological interest. An "emergency task force" for immediate investigation of accidental discoveries, which its staff provides, is a highly important function of the Survey in a state where the doubling of population in recent years has redoubled the rate of disturbance of archaeological remains.

It is evident that the *Reports* are aimed along that elusive middle course where others have foundered in the past, in trying at the same time to satisfy the needs of the professional and to guide the amateur. In the first numbers published, at least, this course is followed with considerable skill. The contents are decidedly professional, complete and systematic; at the same time, the text and the annotations accompanying the bibliographies provide a clear and simple orientation for non-specialists who may work with the materials. A well-intentioned amateur provided with the notes, directions, and standard forms for recording archaeological materials which are included in these reports should be able to avoid mistreating his archaeological finds.

Discussions of the mid-nineteenth century hoax celebrated under the name "Calaveras Skull" loom large in the "Bibliography of Ancient Man in California" (*Report* No. 2). Almost one quarter of the total of 185 titles have accumulated around the Calaveras Man controversy since "discovery" of the skull in a mine-shaft in 1866. The remaining 140 items, however, concern another dozen and a half finds—enough to show that California offers significant materials regarding human antiquity in America. Noteworthy items concern recent explorations in Pinto and in related cultures, such as at the Stahl site and Topanga Canyon sites.

Steward's comprehensive study of California petroglyphs, published in 1929, is brought up to date by the 64 additional titles of papers and manuscripts included by Fenenga in *Report* No. 3. This report carries plates showing characteristic petroglyph design elements and the style areas in which they occur. Fenenga also presents and explains the standard form for recording new petroglyph discoveries, and describes methods for copying painted, pecked, or rubbed groove types of petroglyphs.

The "Bibliography of the Archaeology of California," *Report* No. 4, is likely to be the most generally utilized of these works. Almost 400 entries are included, subdivided into sections dealing with classes of objects, and with provisionally defined archaeological areas of the state. Sections offering background material in the physical environment, in ethnography, and in physical anthropology are included. Like the earlier bibliographies, this is carefully compiled and edited, and the few typographical errors noted by this reviewer are in inconsequential details. Whether designed for the purpose or not, a small amount of space left at the end of each section permits the reader to enter additional titles.

RICHARD K. BEARDSLEY
Department of Anthropology
University of Michigan
Ann Arbor, Michigan

Unos annales históricos de la nación mexicana. Edited by ERNST MENGIN. Corpus Codicum Americanorum Medii Aevi; Litterarum Monumenta in Lingua Nahuatl et Maya . . . , Vol. 2. Copenhagen: Einar Munksgaard, 1945.

Despite the Latin title and the curious attempt to view sixteenth century Mexican manuscripts as somehow linked to the bygone medieval world of Europe, "Unos Annales" or the "manuscrito de 1528" is the oldest known specimen of historical composition in European script from the American mainland. Written in the principal language of New Spain, Náhuatl ("Aztec") and in the part of Mexico City called Tlatelolco, it comprises five related documents, of which Nos. II, III, and IV are congested genealogical and conquest lists. Nos. I and V are fuller narratives, covering the period from prehispanic times to the immediate aftermath of the Conquest. No. I, a "List of the Rulers of Tlatelolco" includes among, other things, a spectacular account (apparently by an eyewitness) of Cortes' march to Honduras (1524–25) and No. V, a "History of Tlatelolco from the Earliest Times" covers the important points of Azteca-Mexica history from their early wanderings down to the siege of Mexico. The latter is movingly described by one of the defenders, and is comparable only to Sahagun's Book XII (Seler, *Einige Kapitel*).

Long known to Mexicanists by reference, these texts have been circulated at last by Dr. Mengin (paleography and German translation, 1939, and the present facsimile in 1945).[1] One who has held in his hands the large coarse pages of native paper on which the original is written, can attest that this reproduction is very good. The plates are probably as exact as can be made. That no copy can quite duplicate an original, is obvious, but reproductions *must* be made if such time-resisting monuments are to be divulged among scholars, and perhaps if they are to survive the barbarous twentieth century at all. (One notes that this edition was realized in the West despite the Nazi occupation, while eastward the Slavic libraries were being destroyed.)

The tome is hardly designed for purchase by individual students, but constitutes with its companion volumes a continuation of the tradition of Kingsborough, Loubat, and Troncoso: the monumental reproduction of monumental Mexican pictorial writing and texts. In short, it is a reference work for the larger libraries, who can hardly do without it. The pigskin binding gives merited character to this strongly made book, of which each leaf is cloth-hinged. Paper and impression of plates are excellent, but the engraver shows reprehensible carelessness in trimming the outlines of the plates.[2] A multilingual introduction (perhaps unnecessary to the person whose specialized interest leads him to consult the volume) and a good study of the document precede the reproduction. One is grateful to Dr. Mengin for sustaining this valuable series, whose third volume, we understand, will be the "Annals of the Cakchiquels."

R. BARLOW
Mexico City College
Mexico, D. F.

The Conquest and Colonization of Yucatan, 1517–1550. ROBERT S. CHAMBERLAIN. Publication, Carnegie Institution of Washington, No. 582. Washington, 1948. vi+365 pp., illustrations, maps.

The publication of this scholarly monograph, the fruit of many years of research, covering a relatively neglected period and area, will be warmly welcomed by students of the Latin American field. Based on an extensive use of the printed chronicles and documents, enriched by wide citation of hitherto unused original documentary sources, the narrative centers around the career of the Adelantado Francisco de Montejo, who directed the long and difficult conquest of the Maya Empire and laid the foundations of Spanish settlement in, and governmental control of, the area.

The story starts with the discovery of the Peninsula of Yucatan by Francisco Hernández de Córdoba on a slave-hunting expedition from Cuba in 1517. After recounting Montejo's early role in the conquest of Mexico and the struggle between Cortés and Velásquez, the governor of Cuba, over the right to conquer and colonize the peninsula, the civilization and potential riches of which, given the example of Mexico, were quite alluring, the main story starts with Montejo's royal grant of authority to conquer and colonize Yucatan, erroneously called "Islands," in 1526. The main body of the narrative is next concerned with the invasion of Yucatan, starting in 1527, with the conquest of Cozumel Island and the adjacent coast of Salamanca de Xelha. After the subjugation of the Chikinchels, the long conquest from the west, of Tabasco and Acalán, in the years 1529–1531, is recounted with emphasis on the founding of Salamanca de Campeche in 1531. After a brief treatment of Montejo's interim career, there is a discussion of the Spanish withdrawal from Yucatan late in 1534, followed by the full narrative of the final conquest launched in 1547. Appropriate chapters on the Church, with stress on the Franciscans, government, and colonization into 1550, conclude the account. Montejo's suspension from office, final years, and death are recounted and the passing of the title to his descendants as an honorary office receives due attention.

The volume lacks an index, so that the details have to be tracked down page by page. The map opposite p. 164, mingles Spanish and English place names so that you have "Isla de Mujeres" adjacent to "Cozumel Island," "Río Hondo" is next to New River, the Bay of Honduras lies below the "Bahía de Espíritu Santo," with an accent misplaced on "Espíritu." "Mar del Norte" appears as North Sea, and there is South Sea or Pacific Ocean instead of "Mar del Sur." These and other examples of the intermingling of the two languages may confuse some readers. Save in a few instances, the actual text of supporting archival materials is not printed in the footnotes and only an

[1] A Spanish language edition derived from Mengin with analytical notes appeared in 1948 as "Anales de Tlatelolco."

[2] Note the discrepancy in outlines of recto and verso of the same leaf, published as Pls. 3 and 4.

archival citation appears. On the other hand, printed materials are rather extensively reproduced. Despite these minor defects, the work fills a gap in the historiography of the Spanish conquest and settlement of an important area in the sixteenth century. If rewritten or expanded it should include some account of the early French corsairs, who in the late 1540's and the next decade raided the coast of Yucatan and whose exploits are recounted in numerous unused documents in the Archives of the Indies in Sevilla.

ARTHUR S. AITON
University of Michigan
Ann Arbor, Michigan

The Pre-History of the Lagôa Santa Region (Minas Gerais). H. V. WALTER. Belo Horizonte, Brazil: Velloso & Cia, Ltda., 1948. 165 pp., 71 pls.

This paper, with texts in both English and Portuguese, is of particular interest to archaeologists for at least two reasons: the discussion of a fairly recent find of allegedly Pleistocene *Homo sapiens*, and a description of seven specific archaeological sites.

Of the twelve chapters in the book, three of them deal with extinct non-hominid mammalian forms found in the Lagôa Santa region (25 square miles, north of the village of Lagôa Santa in the state of Minas Gerais, Brazil). Walter gives a lucid general discussion of extinct Pleistocene mammals as well as a detailed description of two forms, an extinct short faced bear ("*Arctotherium brasiliensis*") and a fossil armadillo ("*Hoplophorus euphractus*" Lund), discovered, respectively, in 1940 and 1944. Paleontologists can best assess the value of this material although to the reviewer it appears to be competently presented.

Students of early man in America will be particularly interested in the discussion of Confins Man and Pedro Leopoldo Man, two finds of *Homo sapiens* to which the author attributes Pleistocene age. Both are morphologically similar to several of the Lagôa Santa finds made by the Danish paleontologist P. W. Lund in mid-nineteenth century. Many readers will recall the article on Confins Man by Cathoud, Mattos, and Walter which appeared in *Early Man*.[1] The present discussion is more lengthy and includes information on the geological and topographical formation of Confins Cave (where the skeleton was found), as well as a description of the discovery.

Pedro Leopoldo Man was found in 1940 in a deposit containing typical Lagôa Santa Pleistocene fauna. The skeleton, that of a member of the masculine sex, probably about 50 years of age, lay in an extended position 12 feet below the surface. The skull was badly crushed but many of the long bones were in a good state of preservation. No artifacts were associated with the find although many fragments of charcoal and ash were contained in the earth around the skeleton. With regard to the skulls of Confins Man and Pedro Leopoldo Man, Walter indicates his belief that in many respects they are similar to others of what he calls the Lagôa Santa race and "are relatively modern in type. Nevertheless they possess certain features which are regarded as primitive, such as prognathism, dolicocephaly, relatively low vault, thickness of cranium bone, posteriorly placed mental foramen (Pedro Leopoldo skull), width of mandible and broad rami" (p. 93). In view of this statement it is difficult to see why Mr. Walter believes that early man in the region (including Confins, Pedro Leopoldo, and the finds of Lund) was a "savage, probably of Mongolian type" (p. 19).

In a potentially important find such as Pedro Leopoldo Man, one might expect (*a*) much greater detail in describing excavation techniques, (*b*) a more thorough discussion of the geological circumstances, (*c*) a note on techniques used in reconstructing the skull, and (*d*) some description of the points used in taking anthropometric measurements. In the present work (*c*) and (*d*) are neglected, (*a*) is only briefly touched upon, and (*b*), the matter of geological provenience, while discussed, leaves some doubt in this reviewer's mind as to the certainty of assigning Pedro Leopoldo to the Pleistocene. We are told that the bones of the Pleistocene fauna which overlay and surrounded the skeleton may have been carried in from a higher level. The skeleton itself appeared to be undisturbed; could it not have been a post-Pleistocene deposit, later covered with the earlier materials? A more detailed and thorough discussion of the problem might have removed this doubt.

Three chapters are devoted to cultural materials found at several sites in the Lagôa Santa region. After a very general, and often uncritical, discussion of the prehistory of the area, the author turns his attention to the matter of lithic implements of the "Lagôa Santa race." (This designation is never clearly defined. Presumably it includes Pleistocene finds made by Lund, Walter and others, but does it include more?) Discussing four non-pottery sites in the region, three rock shelters and one cave, the author assigns the material from all of them to one cultural horizon, characterized by "axe-heads, hammers, pestles, mullers, anvil-stones, marked pebbles, and odd natural shaped stones" (p. 27). At the same time, using typological differences, he suggests a chronological order for the four sites on the basis of relative crudeness of implements. The four sites, from oldest to most recent, and their materials are: Campo Alegre, chipped axe and crude hammerstone; Carancas, quartz rejects, flaked axes, polished muller, pebble hammerstones; Site 1 at Lapa Vermelha, flaked hematite axe-head, quartzite pebble hammerstone, semi-polished axe heads; Lapa do Galinheiro, polished diabase axe-heads, partly polished hematite axe-head. (Some of the "axe heads," at least, are celts.) Some cultural variation is certainly evident at these four sites—what it is or what the implications are, Walter does not say. He suggests, apparently on the basis of typological considerations alone, that the sites may be of Pleistocene age.

Of final interest to the prehistorian, is Walter's discussion of Lapa Vermelha (a large limestone formation) where he recognizes four separate sites, one of which, No. 1, has been mentioned above. To the trait list already presented for No. 1, Walter adds: quartz rejects, two fragmentary pieces of bamboo, an arrowpoint of palm stem, burned snail shells

[1] H. V. Walter, A. Cathoud, and Anibal Mattos, "Confins Man: a Contribution to the Study of Early Man in South America," in *Early Man* edited by G. G. MacCurdy, Philadelphia, 1937, pp. 341–8.

("*Strophocheilus*"), and a piece of polished horn. It is evident that this material was scattered at different depths in various parts of the cave but no clear picture of stratigraphy or horizontal location is given. All of the material is treated as if it belonged to a single culture of "the first inhabitants to settle in the region several hundred, or maybe a few thousand years ago" (p. 41). No data are presented to substantiate this statement. Perhaps several cultural manifestations are present here; careful observation of stratigraphy is needed.

At Site 2, Lapa Vermelha, located at the foot of the limestone escarpment, three occupation levels were found in addition to drawings in red pigment, which were discernible on the rocks. The lowest level lacked pottery while the top two contained "coloured and engraved" sherds. . . . A burnt clay bead is also assigned to the middle level. In addition to the pottery fragments and the bead, burned animal bones were the only things found at this site.

Site 3, a campsite on a narrow ledge near a cave entrance 100 yards from Site 2, produced a few skeletons, several well polished axe-heads, hammerstones, mullers, two clay pipes with embossed designs, and perforated animal (*carpincho*) incisors. "The implements show a better degree of workmanship than those of Site No. 1 and no doubt belong to a later tribe which inhabited the valley in relatively recent years, possibly at the advent of the white man" (p. 45). No evidence is given for this statement. The designs on the two pipes, equal armed elbow pipes with expanding bowl and stem, are not clear in the photographs.

Site 4 is represented by fragments of thick crude pottery scattered over 50 square yards of ground between the road (*sic!*) and Site 3. Walter says the pottery is similar to that used for making funeral urns (by whom?) and that some fragments of the painted pottery probably belong to cooking pots. Again, no further clarification. He attributes this material to recent Indians, the Botocudos. Obviously, there is a crying need for careful attention to stratigraphy at the sites being discussed. However, it is characteristic of many studies of Brazilian prehistory that stratigraphy tends to be neglected and typology relatively over-emphasized.

Although Walter's book gives us many new data regarding the archaeology of a particular section of Brazil, one has the feeling that much more could have been done with the material at his disposal. The value of the present work would have been enhanced by a discussion of excavation techniques, of methodological and conceptual considerations, and more thorough descriptions of artifacts, as well as by comparisons with other published materials, particularly from coastal Brazil. It must also be apparent from the foregoing that Mr. Walter has made assertions and statements of fact without offering either proof for them or the reasoning through which he arrived at his conclusions. Here again, the report suffers. It is to be hoped that in future publications some of these weaknesses will be remedied.

Viewing the book as a whole, dealing as it does with archaeology, physical anthropology, and paleontology, one is impressed by the fact that the archaeological section is the most incomplete and the paleontological the most competently done. This may indicate the author's greater interest in fossil mammalia than in cultural materials. The paper is not without value for the archaeologist, however' and it should be consulted by students of Early Man and South American prehistory.

VIRGINIA WATSON
St. Louis, Missouri

Excavations in the Cuenca Region, Ecuador. WENDELL C. BENNETT. Yale University Publications in Anthropology, No. 35. New Haven, 1946. 84 pp., 17 figs.

In 1943 John Murra and I suggested that Azuay was the most crucial area of the south Ecuadorean sierra for immediate survey and excavation. We predicted that stratified sites would be found there.[1] A year later, Wendell Bennett was carrying out an eight weeks' program of surveying and digging in the Cuenca region of Azuay. Although his work produced extremely useful results, to our, and doubtless Bennett's, chagrin he did not encounter the productive stratified deposits that we had envisioned. This experience emphasizes the difficulty of finding deep stratified refuse in the highland of Ecuador and in fact, the entire Andean sierra, and also emphasizes how lucky we were to encounter such excellent stratigraphic conditions at Cerro Narrío in Cañar Province, just to the north of Azuay, which enabled us to establish an early, a late, and an Inca period.

Bennett's survey covered 18 sites: one near Azogues, 9 near Paute, one near Cuenca, and 7 near Cumbe and farther south along the Pan American highway. In addition to collecting surface sherds, he dug test pits at several sites and made more extensive excavations at two of the Paute sites, the latter two being the only ones, with a single exception, having deposits more than 20 cm. in depth. He did not find any sites comparable in size, concentration of materia], or depth to Cerro Narrío. Five of the Paute sites contained ceramics of Cerro Narrío style, and these Bennett breaks into two sub-styles, called Monjashuaico and Huancarcuchu. The remaining sites of the survey contained pottery of a rather generalized thick ware style not directly affiliated with the Narrío style.

The Huancarcuchu and Monjashuaico sub-styles both include a red-on-buff pottery and a polished red pottery, which I would not hesitate to throw into the Cerro Narrío types Narrío Red-on-buff, Narrío Red-on-buff Fine, and Cañar Polished. Bennett points out these similarities but does not set up his wares as pottery types. Bennett's substyles differ from the Early Cerro Narrío style in lacking certain Narrío minor types and features, and possessing others not present at Cerro Narrío. Most significant of the latter are the presence in Monjashuaico of an incised red-on-buff, a polished black ware, and other features that serve to differentiate Monjashuaico from Huancarcuchu as well as from Early Cerro Narrío. Bennett suggests convincingly that Huancarcuchu is contemporaneous with the latter part of Early Cerro Narrío, and that Monjashuaico is earlier than Huancarcuchu and slightly earlier than Early Cerro Narrío. His reasoning is that since the two Azuay substyles existed in the same restricted area they were not contemporaneous; that trends in the Monjashuaico site are

[1] Donald Collier and John V. Murra, "Survey and Excavations in Southern Ecuador," *Anthropological Series, Field Museum of Natural History*, Vol. 35, Chicago.

in the direction of Huancarcuchu; and that Monjashuaico fits best at the bottom of the Cerro Narrío sequence.

The Monjashuaico site contained a cultural deposit 2.5 meters deep, the upper 50 cm. of which contained thick ware styles and the lower 150 cm., the Monjashuaico sub-style. The deposit was dug in arbitrary 50 cm. levels. In his analysis of the Monjashuaico sub-style Bennett treated the three Monjashuaico levels as a unit rather than by level, on the grounds that comparisons of the three levels with each other showed no significant differences. Yet his placing of the Monjashauico sub-style earlier than Huancarcuchu is based in part on style trends within these three levels. I accept Bennett's judgment in the matter, but the point would have been more convincingly made if the Monjashuaico site had been dug in 25 cm. or 15 cm. levels, and if Bennett had published the percentage distribution by level of the various Monjashuaico wares in order to objectify the trends that were present.

The thick ware styles of Azuay, which Bennett places late because of certain resemblances to the pottery of Late Cerro Narrío and because of their stratigraphic position above Monjashuaico at the Monjashuaico site, are rather nondescript and include minor types, the exact relationship of which is unclear. The contrasts with Late Cerro Narrío seem to be as great as or greater than the similarities. Furthermore, Bennett found no evidence of the northern influences (characterized by quartz-studded, red-banded incised, polished red and black engraved, Tuncahuán, and Puruhá ceramics) so important during the Late Period at Cerro Narrío.

Bennett did not work in the Chordeleg-Sigsig region of Azuay, which is the locality of most of the famous tombs that were looted of their gold during the past century. Work is still very much needed in this region to connect the tombs with ceramic and other cultural materials and to place them chronologically.

The most important results of Bennett's work were to extend the Cerro Narrío sequence into Azuay, to add a period there somewhat but not much earlier than Early Cerro Narrío, and to confirm that cultural development during the Late period in Azuay followed somewhat different lines than in Cañar. The concluding chapter of Bennett's report is a lucid and extremely useful summary of Ecuadorian archaeology as a whole. He divides Ecuador into three highland and three coastal units, discusses chronological relationships and the possibility of using Tuncahuán as a horizon style, and examines Colombian and Peruvian relationships. He concludes that Ecuador belongs culturally as well as geographically with the northern Andean region rather than with the central Andes.

DONALD COLLIER
Chicago Natural History Museum
Chicago, Illinois

Philippine and East Asian Archaeology, and its Relation to the Origin of the Pacific Islands Population. H. OTLEY BEYER. v+130 pp., 2 maps, 37 pages of illustrations. Bulletin, National Research Council of the Philippines, No. 29. Quezon City, December, 1948.

Most of this valuable paper is devoted to discussing the artifacts characteristic of the successive Philippine cultural horizons, in part established by stratification, in the Philippines, on the Asiatic mainland, or elsewhere in Malaysia, and in part based on typology of artifacts and their apparent local development in some cases. Appendix 2 is devoted to a tentative horizon-list or chronology.

Another of Professor Beyer's publications, destroyed by fire on May 8, 1948, through the burning of the Bureau of Printing at Manila, except for five sets of page-proof, supplements the present paper and gives further details of distribution as revealed by its title: "Outline Review of Philippine Archaeology by Islands and Provinces." This is being reprinted and should be available ere long.

This latest contribution to knowledge by Professor Beyer is of special interest to students of Oceanian culture, since it sets forth his views as to the relationship of the archaeological horizons in the Philippines to those elsewhere in Malaysia, on the Asiatic mainland, and in outer Oceania.

The earliest Philippine material is dated as probably mid-Pleistocene, followed by late Pleistocene. Mesolithic, or pre-Neolithic finds (mostly microlithic), come from more than a hundred sites in Luzon alone. Proto-Neolithic implements, represented, for example, by chipped axes with ground blades as in Australia, are next in his ascending series of types. No human skeletal remains have yet been found that can certainly be attributed to these four early horizons.

Beyer (p. 19) follows Heine-Geldern in the main in recognizing Early, Middle, and Late Neolithic horizons typified respectively by cylindrical or oval axe-adze, shouldered axe-adze, and rectangular adze. The Early Neolithic axe-adze (Walzenbeil) is found as far east as Fiji and southwestern Polynesia. Beyer subdivides Heine-Geldern's general types and discusses their distributions and the implications these offer as to routes of culture travel. For example, 90 per cent of the Early Neolithic types found in Indo-China are almost exactly duplicated by similar types on Luzon. Beyer recognizes probable migration routes from both southeast and northeast Asia throughout his discussion.

Of special interest to Polynesian scholars is Beyer's evidence (p. 32) of the development of "the tanged Hawaiian and East Polynesian adze form" in Luzon during the Middle Neolithic. On page 35 Beyer states: "The Pacific Island cultures are basically of Middle Neolithic origin, with their distribution into Polynesia extending over into the early phase of the Late Neolithic. . . . That the original cultures developed in Eastern Asia there can be no doubt. . . . The first true tanged [adze] form, in its primitive state, was probably a real development of the Hoifung-Hongkong area (or somewhere near that vicinity). . . . The primitive tanged type then crossed over into Luzon, where it underwent still further development into the full tanged form of the Hawaiian and East Polynesian type."

Beyer's ideas as to the movement of Neolithic cultures into the Pacific Islands is well summarized on page 37: "The Early Neolithic culture moved but slowly, and had spread no further away from the Asiatic mainland than the Melanesian region when the more rapidly moving Middle and Late Neolithic cultures overtook and passed it by—while they continued onward together and spread them-

selves over the farthest reaches of the Pacific."

Beyer (p. 50) is of the opinion that the extensive Philippine use of nephrite in the Late Neolithic warrants the following statement: "In fact the use of nephrite in New Zealand and in New Guinea and other parts of Melanesia, plus the close kinship in form and workmanship both of certain of the plain-backed and the early stepped adzes and chisels, are strong arguments for a definite contact from the Philippines along a southeastward migration route. In my opinion it now seems evident that such a route first began to develop in the Early Neolithic, and was increasingly followed in the Middle and early Late-Neolithic—gradually dwindling in later times, and ceasing altogether when the Malayan peoples entered the Philippines from the southwest bearing the very different culture exemplified in the remains of the Early Iron Age." The source of nephrite used in the Philippines has not been discovered (p. 48).

Unlike various stone-age phases of culture which Beyer derives directly from related phases on the Asiatic mainland, "the Iron-Age culture flood came from the south and pushed steadily northward across Borneo and the Philippines to Formosa and beyond. The natural Late Stone-Age migration lines to the southwestward [southeastward?] appear to have been wholly disrupted—and thus the latest Philippine Stone-Age types did not reach the Pacific Islands" (p. 73).

In this paper Beyer has set up time and space outlines which remain to be validated and elaborated by further work in the Philippines and especially in the island world from Sumatra to Easter Island. No doubt his scheme will be modified by future findings, but I feel that the essentials of his "skeleton" frameworks of time sequence and geographic distribution will stand. It remains to put more "flesh" upon them through the media of study of existing collections and much more archaeological field work.

E. W. Gifford
University of California
Berkeley, California

ANNUAL MEETING OF THE SOCIETY FOR AMERICAN ARCHAEOLOGY, 1949

The fourteenth annual meeting of the Society for American Archaeology was held on Friday and Saturday, May 13 and 14, 1949 in the Indiana Union Building, Indiana University Bloomington, Indiana. This meeting took place in conjunction with the twenty-fifth annual meeting of the Central States Branch of the American Anthropological Association.

MEETING OF THE EXECUTIVE COMMITTEE

A meeting of the Executive Committee was held preceding the regular business meeting of the society. Approval was voted of the budget for the coming year, as printed below (p. 178). The Treasurer was authorized to try to collect money owed to the Society by an institution in Argentina in payment for back numbers of AMERICAN ANTIQUITY. He was also authorized to take measures to increase the membership of the Society. Approval of the report of the Elections Committee on the results of the balloting by mail was voted and the election was declared closed.

It was voted to support the National Council for Historic Sites and Buildings and a contribution of $25.00 was approved for this.

ANNUAL BUSINESS MEETING

The annual business meeting of the Society was called to order by President Waldo Wedel at 4 P.M. on Friday, May 13, 1949. Approximately 40 persons were present.

The minutes of the thirteenth annual meeting were not read, but were approved as published in AMERICAN ANTIQUITY, Vol. XIV, No. 2 (October, 1948).

The report of the Secretary was read and accepted (see below, p. 172 for this report).

The report of the Treasurer was read and accepted (see below, pp. 172–3).

The report of the Auditing Committee was also read and accepted (see below, p. 173).

The report of the Editor was read and accepted (see below, p. 174).

The Elections Committee (George Quimby, Chairman; Donald Collier, and Elaine Bluhm) announced the results of the balloting by mail (272 ballots) for new officers, as follows:

President	J. O. Brew
First Vice President	F. de Laguna
Second Vice President	S. Linné
Members of the Executive Committee	P. S. Martin (to 1951)
	J. D. Jennings (to 1951)

On behalf of the Department of Anthropology at the University of Minnesota, Dr. Wilson D. Wallis extended an invitation to the Society to hold its next annual meeting at Minneapolis. Dr. Karl Schmitt, on behalf of the University of Oklahoma, invited the Society to hold its next annual meeting at Norman, Oklahoma. Both invitations were referred to the Executive Committee for decision as to time and place.

A motion by James B. Griffin, amended by W. C. McKern, was seconded and approved by a majority voice vote. This motion enjoined the President of the Society to appoint a committee of not more than sixteen members to investigate the question of changing the official spelling of the word, "archaeology" to "archeology."

Douglas Byers moved that the President appoint a committee to codify and formulate the criteria of selection of the Viking Fund Medalist in Archaeology, that the findings of this committee be made available for review by the Executive Committee by September 1, 1949, and that their reviewed findings be given to the Viking Fund Award Committee with the understanding that these findings be considered a guide to the criteria of selection of the Viking Fund Medalist and are not binding upon the Viking Fund Award Committee. This motion was seconded and approved by a standing vote of 18 members for and 11 members against.

The following resolutions were presented by the Committee on Resolutions (Paul S. Martin, Chairman).

Resolved: That the Society for American Archaeology hereby express its appreciation to Indiana University and its Department of Anthropology for their warm hospitality and for their generosity in placing at the disposal of the Society all facilities of the University.

Resolved: That the Society express its appreciation to the members of the Local Arrangements Committee and particularly to Dr. Erminie W. Voegelin, Chairman.

Resolved: That the Society for American Archaeology express its deep regret at the death, since the last meeting, of the following members: Frank A. Kelly, John H. Bailey, and Sylvanus G. Morley.

Douglas Byers moved that the Society for American Archaeology at its annual meeting, recognizing that notification of meeting was not given as specified in the Constitution, hereby accepts and confirms the acts of this annual meeting and declares the officers duly elected. This motion was seconded and approved by a majority voice vote.

The annual business meeting adjourned at 5:30 P.M.

ANNUAL DINNER

The annual dinner of the Society for American Archaeology and the Central States Branch of the American Anthropological Association was held at the Indiana University Union Building at 6:30 P.M. on Friday.

OTHER SESSIONS

On Friday morning the following archaeological papers were presented at a joint session with James B. Griffin presiding:

1. "The Archaeology of Arnhem Land, Australia." FRANK M. SETZLER, United States National Museum.
2. "Traditions, a Proposed Method of Cultural Comparisons." JOHN C. MCGREGOR, University of Illinois.
3. "Corn as a Clue in North American Archaeology." VOLNEY H. JONES, University of Michigan.
4. "Age Determination by Radiocarbon Content." J. R. ARNOLD, Institute for Nuclear Studies, University of Chicago.

During this session there was an address of welcome by Herman B. Wells, President of Indiana University.

On Friday afternoon, with Waldo R. Wedel presiding, the following papers were presented:

1. "Suggested Relationships between Preceramic Horizons in the Southeast and Southwest." WESLEY R. HURT, JR., University of Michigan.
2. "Certain Cultural Correspondences in the Southwest and Mississippi Valley in Prehistoric Times." JAMES B. GRIFFIN, University of Michigan.
3. "A Season's Work in Transitional Pueblo II and Pueblo III Sites." GEORG NEUMANN, Indiana University.
4. "The Pottery Sequence in Hopewell Sites of Central Illinois." ELAINE BLUHM, University of Chicago.
5. "Recent Information on Archaeological Sites in the Washita River Valley, Oklahoma." WILLIAM M. HUNT, University of Oklahoma.

The meeting closed with a session on Saturday morning at which Albert C. Spaulding presided. The following papers were presented:

1. "An Archaeological Survey of the Trent Waterway in Southern Ontario, Canada." WILLIAM A. RITCHIE, Rochester Museum of Arts and Sciences.
2. "Cultural Stratigraphy at Starved Rock, Illinois." KENNETH G. ORR, University of Chicago.
3. "Fort Ancient Manifestations in LaSalle County, Illinois." GORDON KELLER, University of Chicago.
4. "A Non-Pottery Culture at Starved Rock, Illinois." WILLIAM MAYER-OAKES, University of Chicago.
5. "Archaeological Excavations at Moccasin Bluff, Michigan." HALE G. SMITH, University of Michigan.

REPORT OF THE SECRETARY

During the past year, 1948–49, the following committee and other appointments were made by President Waldo R. Wedel and approved by the Executive Committee.

Nominating Committee: W. C. McKern, Chairman; Douglas S. Byers; and J. Alden Mason.

Elections Committee: G. I. Quimby, Chairman; Donald Collier; and Elaine Bluhm.

Viking Fund Award Committee: W. R. Wedel, Chairman ex officio; W. C. Bennett; J. O. Brew; R. F. Heizer; W. C. McKern; Irving Rouse; and G. R. Willey.

Auditing Committee: Paul Weer, Chairman; William J. Wallace; and Georg Neumann.

Program Committee: Donald Collier, Chairman; Albert Spaulding; and W. J. Wallace.

Local Arrangements Committee: Erminie W. Voegelin, Chairman; Glenn Black; George Neumann; and W. J. Wallace.

Committee on Resolutions: Paul S. Martin, Chairman; Frederick Johnson; and G. I. Quimby.

Delegate to the International Congress of Prehistoric and Protohistoric Sciences in Budapest: James B. Griffin.

Representative to the Inter-American Society of Anthropology and Geography: W. Duncan Strong.

In September, 1948 the Executive Committee voted to accept an invitation extended by the Department of Anthropology at Indiana University to hold the next annual meeting of the Society in Bloomington, Indiana. The week end of May 13 and 14 was selected as the time for the meeting.

A special meeting of the Society, for non-business purposes, in conjunction with the meetings of the American Anthropological Association, December 28–30, 1948 was authorized by the Executive Committee. Dr. Wm. A. Ritchie was appointed Program Chairman for this meeting.

The Executive Committee authorized the participation of the Society as a sponsor for the 29th International Congress of Americanists in New York City in September, 1949; but disapproved of a contribution of $100.00 or less to the Organizing Committee of the Congress.

The Executive Committee also refused to authorize a contribution by the Society of $100.00 or less toward the support of a central dendrochronological laboratory at the University of Oklahoma.

During the year those membership files in the Secretary's keeping were completely checked and corrected. A number of routine inquiries about the Society and membership were handled and a system of balloting by mail was devised and used in the annual election of the Society.

Respectfully submitted,
GEORGE I. QUIMBY, *Secretary*

REPORT OF THE TREASURER

ACCOUNT OF MEMBERSHIP

During the fiscal year 1948–49 the total membership decreased from 946 to 937. The changes were as follows:

	Active	*Institutional*	*Life*
May 1, 1948	741	192	13
New and reinstated	+85	+20	0
	826	212	13
Dropped, resigned, and deceased	−96	−18	0
May 1, 1949	730	194	13

We have on our books eight complimentary and exchange members, none of whom are included in the above totals.

WORKING FUND

Receipts

Beginning balance brought forward, 5/1/48			$ 3,348.75
Income from dues and subscriptions:			
Prior years	$ 23.50		
1948–49	5,138.50		
Prepaid	465.00		
		$5,627.00	
Contributions		8.00	
Sale of AMERICAN ANTIQUITY		578.00	
Reimbursement for reprints		589.00	
Reimbursement for illustration charges		101.98	
Receipts of a sundry nature:			
Charges for excessive alteration in page proofs	$ 7.30		
Overpayment on sale of publications	.50		
Postage	.54		
Transfer from Publication Fund to Working Fund to defray cost of MEMOIR No. 4	2,259.21		
Sales of strip list of membership	3.39		
Exchange charges on Canadian postal notes	.13		
		2,271.29	
			9,175.27
			$1,224.02

Expenditures

Publishing AMERICAN ANTIQUITY and MEMOIR No. 4:		
Printing	$6,310.37	
Illustrations	1,027.65	
Distribution	105.69	
Reprints of articles to be sold to authors	570.94	
		$8,014.65
Editor's Account		540.56
Treasurer's Account		241.21
Expenditures of a sundry nature:		
Miscellaneous printing	$ 47.63	
President's office	27.02	
Secretary's office	38.15	
Contribution transferred to Publication Fund	4.00	
Transfer of budget-approved sum from Working Fund to Publication Fund for MEMOIR #5	600.00	
Cost of 1948 annual meeting	28.19	
Checks returned to payor for amendment due to improper signature, dating, etc.	26.00	
Exchange and collection charge	1.36	
Representation of the S.A.A. on the Committee for the Recovery of Archaeological Remains	50.00	
Refund for overpayment of dues and adjustment of accounts	2.50	
		824.85
Total expenditures		$ 9,621.27

Balance

Total receipts	$12,524.02
Total expenditures	9,621.27
Balance, cash on hand	$ 2,902.75
Balance, cash on hand, broken down as follows:	
General operating balance	$ 1,930.56
Planning Committee fund	972.19
	$ 2,902.75

BALANCE SHEET[1]

Resources

Cash in checking account, General Operating Balance		$1,930.56
Publication Fund, savings account		1,784.76
Dues receivable	$9.00	
Other accounts receivable, sale of AMERICAN ANTIQUITY and MEMOIRS	$ 26.30	
Charges for extra illustrations in AMERICAN ANTIQUITY	51.18	
	77.48	
		86.48
Guaranteed grant-in-aid from the University of Texas, account MEMOIR No. 5		$2,500.00
Guaranteed grant-in-aid from the author of MEMOIR No. 5		537.18
Total, general operating assets		$6,838.98
Cash in checking account, Planning Committee		972.19
Permanent Fund (life memberships)		860.33
Total resources		$8,671.50

Liabilities and Capital

Dues, prepaid	$ 465.00	
Estimated bills payable	5,106.20[2]	
		$5,571.20
Restricted Capital:		
Planning Committee	$972.19	
Permanent Fund (life memberships)	860.33	
	$1,832.52	
Free capital	1,267.78	
	$3,100.30	
Total, liabilities and capital		$8,671.50

PERMANENT FUND

Balance brought forward, 4/30/48		$851.80
Interest computed:		
June 30, 1948	$4.25	
December 31, 1948	4.28	
		8.53
Balance, 4/30/49		$860.33

PUBLICATION FUND

Balance brought forward, 4/30/48		$3,415.39
Contribution, transferred from Working Fund	$ 4.00	
Budget-approved transfer from Working Fund for MEMOIR No. 5	600.00	
Interest computed:		
June 30, 1948	15.71	
December 31, 1948	8.87	
		628.68
		$4,043.97
Withdrawal, transfer to Working Fund to pay for expenses of MEMOIR No. 4, 7/19/48		2,259.21
Balance, 4/30/49		$1,784.76

REPORT OF THE AUDITING COMMITTEE

We, the undersigned, appointed as the Auditing Committee, report that we have examined the Treasurer's accounts as submitted for the fiscal year May 1, 1948 to April 30, 1949 and find them correct and in order.

GEORG NEUMANN
WILLIAM J. WALLACE
PAUL WEER, *Chairman*

[1] As of May 1, 1949.

[2] Estimate broken down as follows:

Publishing AMERICAN ANTIQUITY, Vol. XIV, No. 4	$1,469.02
Publishing MEMOIR No. 5	3,637.18
Total estimated bills payable	$5,106.20

BUDGET FOR 1949–50

ESTIMATE OF INCOME

Estimated beginning balance brought forward:			
Balance forward, Working Fund			$ 1,465.56
Balance forward, Planning Committee			972.19
Estimated income from dues-paying members and subscribing institutions:			
Prepaid dues brought forward as follows:			
1 partly prepaid member at	$ 3.00	$ 3.00	
13 fully prepaid members at	6.00	78.00	
1 fully prepaid member at	12.00	12.00	
86 partly prepaid institutions at	3.00	258.00	
15 fully prepaid institutions at	6.00	90.00	
1 fully prepaid institution at	9.00	9.00	
1 fully prepaid institution at	15.00	15.00	
			465.00
Additional remittances due from the above partly prepaid members and institutions:			
1 partly prepaid member at	$ 3.00	$ 3.00	
86 partly prepaid institutions at	3.00	258.00	
			261.00
Dues, in addition to the above:			
715 members at $6.00		$4,290.00	
91 institutions at $6.00		546.00	
			4,836.00
Sale of AMERICAN ANTIQUITY			500.00
Guaranteed grant-in-aid from University of Texas, account MEMOIR No. 5			2,500.00
Personal guarantee from author of MEMOIR No. 5			537.18
Transfer from Publication Fund to Working Fund, account MEMOIR No. 5			600.00
Collection of outstanding accounts receivable			86.48
Total estimated income			$12,223.41
Deficit in income needed to cover estimated expense for the fiscal year 1949–50			$ 726.06
			$12,949.47

ESTIMATED EXPENSE

Publishing AMERICAN ANTIQUITY, Vol. XIV, No. 4		$1,469.02[2]	
Publishing AMERICAN ANTIQUITY, Vol. XV, Nos. 1–4		5,876.08[2]	
Publishing MEMOIR No. 5		3,637.18	
			$10,982.28
Planning Committee expense			972.19
Editor's account:			
Editorial assistant ($50.00 per quarter, AMERICAN ANTIQUITY)		$ 200.00	
Editorial assistant, MEMOIR No. 5		50.00	
Secretarial assistant (per year)		225.00	
Art work ($12.50 per quarter)		50.00	
Postage, telephone, express on galley proof, etc.		50.00	
			575.00
Treasurer's account:			
Secretarial assistant ($15.00 per month)		$ 180.00	
Postage and billing supplies		50.00	
Printing, stationery, etc.		25.00	
Bank and collection charges		15.00	
			270.00
Miscellaneous expense:			
President's office		$ 25.00	
Secretary's office		50.00	
Annual meeting		25.00	
Incidentals, notices to members, etc.		50.00	
			150.00
Total estimated expense			$12,949.47

[2] Both estimates based upon the highest price paid for any quarterly issue of ANTIQUITY during the fiscal year 1948–49.

REPORT OF THE EDITOR

During the year 1948–49 the Society published Volume XIV of AMERICAN ANTIQUITY, amounting to 360 pages, and MEMOIR Number 5, containing 312 pages. This is equivalent to our maximum of 672 pages, achieved during the year 1946–47.

The Society thus continues to rank second among anthropological societies in amount of publication. In fact, we published only 12 per cent less than the American Anthropological Association during the past fiscal year.[4]

The first three numbers of Volume XIV were general, while the fourth contains a symposium on Missouri Basin archaeology, which has been assembled under the direction of Waldo R. Wedel. MEMOIR Number 5 consists of a monograph "The George C. Davis Site, Cherokee County, Texas" by H. Perry Newell and Alex D. Krieger. The symposium and MEMOIR are being distributed together; their delivery is late because of delays in printing tables for the MEMOIR which has been done in Texas in order to save money.

MEMOIR Number 5 will be a joint publication of the Society and the University of Texas, which is paying most of the costs. In addition, the Viking Fund has generously granted money to cover a deficit which became apparen after publication had begun.

The long anticipated increase in printing costs fin.. took place in the middle of the last fiscal year; it amo to 13 per cent. We were advised that this increase coul partially offset by shifting from English Finish to En. eled paper and thereby eliminating tipped-in plates. This change was made, but has not had an appreciable effect on printing costs, although it has increased the flexibility of illustrations.

Of the 70 manuscripts submitted to the Editor, during the past year for publication as main articles or in "Facts and Comments," 46, or 65 per cent, were accepted, and 24, or 35 per cent, rejected. Half of those rejected were subsequently accepted after revision by their authors. If it were not for the Missouri Basin symposium in the April issue, practically all of this material could have been published during the current year. As it is, there is a back-log of approximately one issue.

It will be necessary to reduce the size of the journal somewhat during the coming year in order to compensate for the increased printing costs. It is planned to do this partially by tightening the standards for acceptance of manuscripts and partially by more careful editing of "Notes and News."

The content of MEMOIR Number 6 has not yet been decided, but it will probably consist of a pair of papers on North Pacific Coast archaeology by Marian W. Smith and Arden R. King. Several other monographs are also under consideration.

Respectfully submitted,
IRVING ROUSE, *Editor*

[4] Figure estimated in terms of manuscript rather than printed pages since the formats are not comparable. It does not include the A.A.A. *News-Letter*, because distribution of the latter is limited.

NOTES AND NEWS

FLORIDA CONFERENCE

On April 9 and 10, Rollins College, Winter Park, Florida, conducted a conference on the Florida Indian and His Neighbors under the guidance of the Inter-American Center. The conference was the opening session of a week's program devoted to Pan America. Cooperating in the program were the National Park Service, the Florida Anthropological Society, and the Seminole Indian Association of Florida. The archaeological sessions were attended by 46 students of the area, representing Canada, 13 states, and the District of Columbia. The papers presented are briefly summarized below.

"Prehistoric Florida Archaeology." JOHN M. GOGGIN. Seven prehistoric cultural traditions are recognized:

1. *Paleo-Indian*, of undefined date, marked by Suwanee points.

2. *Archaic*, of the late fiber-tempered pottery level. This centers in the Indian River and northern St. Johns River areas. Affinities with Stallings Island and Lauderdale are indicated.

3. *St. Johns*, along the coast and the St. Johns River. Pottery making, sedentary villages, and mound building are present. There are three main divisions: St. Johns I, characterized by chalky-ware pottery; St. Johns II, by connections with Gahagan and other sites in Louisiana; and St. Johns III, by Southern Cult objects.

4. *Glades*, centering in the Glades area. This is characterized by the exploitation of coastal tropical foods, earthworks, and sand-tempered pottery.

5. *Malabar*, of the Indian River area. This is a blending of Glades and St. Johns traits laid on an Archaic background without the more elaborate developments of either.

6. *Gulf*, in the northwest coast area. Mound building and some agriculture are present. Weeden Island pottery is distinctive.

7. *Alachua*, around Gainesville. This is characterized by extensive villages, agriculture, and cob- and cord-marked pottery.

"Historic Florida Archaeology." JOHN W. GRIFFIN. Five historic horizons are known:

1. *Florida-Mississippi*, of the Northwest Gulf Coast. This is basically a Middle Mississippi intrusion with carry-overs from Weeden Island. It was probably the culture of the Apalachi at historic contact.

2. *Leon-Jefferson*, in this area related to Spanish missions dated 1670–1725. Mostly aboriginal ceramics are represented.

3. *Spanish-Indian*, characterized by metal objects of Spanish origin and aboriginal pottery.

4. *St. Augustine*, known only from pottery, which includes simple and complicated stamp wares largely dissimilar to the preceding St. Johns.

5. *Seminole*. The archaeology of this period is little known. One burial with much European material has been found.

"General Survey of Southeastern Archaeology." CHARLES H. FAIRBANKS. Southeastern archeology may be summarized in seven cultural groupings:

1. *Folsom* or *Paleo-Indian*, in Georgia, Kentucky, North Carolina, and Virginia. Folsom points with chips of heavy patination, Pinto Basin, and Gypsum Cave types occur.

2. *Archaic*, widespread. Shell middens with no pottery in the lower levels are characteristic. Later steatite and sandstone vessels appear; the first pottery is fiber-tempered. Gradual development in other traits is evident.

3. *Early Woodland*. This is a time of more diverse developments, transitional from Archaic to Woodland. It is still marked by hunting and fishing with small populations. No evidence has been found of mass movement into the area. Granular-tempered pottery is characteristic.

4. *Middle Woodland*. A regional period, showing many connections with Hopewell; there is more evidence of trade and other contacts. Perhaps the first corn and agriculture appears here, but hunting is still more important. There are incised, rocker stamped, and complicated stamp wares. Copena, part of Miller II, Wilmington, St. Johns II, Swift Creek, and Hamilton are all more or less related to this stage.

5. *Early Mississippi*. This period does not have its origin in west Tennessee or Arkansas but probably farther to the north. It is a time of local southeastward migrations, of the first widespread use of agriculture, and of grit- and shell-tempered pottery. Small Log Townhouse, Hiwasse Island, and Macon Plateau are representative to the southeast; Coles Creek and Alto in the Lower Mississippi Valley and east Texas.

6. *Late Mississippi*. There are few pure sites of this period. Negative painted wares and elaborate Southern Cult materials are characteristic. It is not identified with any single linguistic group.

7. *Historic*, of the seventeenth and eighteenth centuries. Mounds disappear, religious buildings are smaller, pottery decoration breaks down, and check stamping reappears.

"The Southeast as Seen from South America." GORDON R. WILLEY. The Southeast is a single ecological zone whereas South America is divided into eight. There are four great cultural groupings in South America:

1. *Marginal* tribes in southern South America and the Gran Chaco. These have a socio-political organization based on kin groups. Technology is meagre.

2. *Tropical Forest* tribes of the south Andean and Amazon areas. These also have kin groups, but with farming, transportation, and larger communities.

3. *Circum-Caribbean* tribes. These live in permanent towns organized on a class basis. Warfare is more important than before.

4. *Andean*. Here, there are true urban centers, a hereditary class system, an organized priesthood, better agriculture, and advanced metallurgical techniques.

In the Southeast the comparable divisions are as follows:

1. *Archaic*, with the same socio-political organization as

the Paleo-Indian group, living like the Marginal peoples of South America.

2. *Woodland*, with a socio-political organization like the Tropical Forest of South America.

3. *Mississippi*. This is similar to the Circum-Caribbean; there is extensive agriculture and real power in the chieftainships.

The Andean has no parallel in the Southeast. Pre-agricultural resemblances are best. Those traits arriving late in the Southeast, such as agriculture, came around via Mexico and were laid on a ground stratum of Archaic to develop into the later Southeastern horizons. A weighty pile of evidence indicates historical relationship between the Southeast and the Circum-Caribbean: incised pottery of various types, modeled animals, and distinct vessel forms. Rim ornaments and negative painting appear in Florida before any place else, and other material traits indicate strong connections with the Circum-Caribbean.

"Meso-America and the Southeast: A Commentary." JAMES B. GRIFFIN. After a review of four major periods in Meso-America: the Paleo-Indian; Formative; Florescent; and Militaristic, the evidence of linguistics and physical anthropology as to prehistoric connections was presented. Somewhat more definite statements were made on the agricultural connections.

Present evidence indicates few specific ties between the two areas on the Archaic and Early Woodland levels of the Southeast. On the Middle Woodland or Hopewellian level, such items as the use of ear spools, well-modeled figurines, ceramic resemblances, and greatly increased evidence of well-organized ceremonialism may reflect Meso-American contact. The general tenor of this period, however, is one of local development from the earlier periods.

In the Mississippi period there are many new cultural developments, some of which seem to have entered the Southeast from Tamaulipas and others may have entered from the Southwest, thus bringing in Meso-American ideas through a Southwestern filter. Connections between the two areas do not seem to be the result of any mass movement of people gradually spreading through the Southeast. As the Mississippi culture developed, later connections with Mexico and Chihuahua probably led to the "Southern Cult" which dominated the ceremonial pattern up to the historic period.

"The Southeast and the West Indies." IRVING ROUSE. After a discussion of the three main Indian groups of the Antilles, Ciboney, Arawak, and Carib, it was noted that four archaeological traditions of culture are pertinent to the problems of West Indian-Southeastern relationships:

1. *Ciboney*, limited to the peripheral parts of the western islands, adjacent to Yucaton and Florida. Pottery is lacking and implements are crude. This was apparently the first culture in the Antilles and was pushed into its historic position by the later comers.

2. *Igneri*, in the eastern and southern islands. It is characterized by polychrome pottery and well made implements, but lacks ceremonial objects. It is believed to represent the original Arawak settlers, who migrated from South America. While it survived adjacent to South America until historic times, two new traditions of Arawak culture developed from it in the northern and western islands, as follows.

3. *Taino*, in the center of the Antilles, particularly Puerto Rico and Hispaniola. The pottery is modeled and incised and there are elaborate ceremonial objects. This is the only culture of the Antilles which can be called Circum-Caribbean.

4. *Sub-Taino*, in the western islands, adjacent to Yucatan and Florida. It is like (3), but less developed and subject to Ciboney influence.

The Ciboney are believed to have been derived from the Archaic of Florida, although Yucatan and Venezuela are also possible sources. The last is the least likely because of the absence of Ciboney remains in the southern half of the Antilles. Subsequent contact between the Ciboney and the Glades tradition of Florida is indicated by the presence in Cuba of burial mounds, cremation, etc., and in Florida of wooden bowls, stools, etc.

The Igneri tradition is unrelated to Southeastern cultures. Sub-Taino has resemblances with the Glades tradition, particularly in ceramic designs (e.g., hatching and crosshatching). These, however, may be due to Ciboney influence and to an ultimate origin of both the Ciboney and the Glades in the Archaic tradition.

While there are similarities between Taino culture and the Gulf and Florida-Mississippi traditions of Florida—as implied by Willey—these are minor. Moreover, the distance between the two is so great and the time period on the Antillean side so short that contacts are to be doubted.

The integration of the papers was summarized by Gordon R. Willey. At the Pan American dinner, Carl E. Guthe spoke on "The Florida Indian and His Neighbors." Later a film, "The Everglades National Park," was presented by Daniel B. Beard, followed by "Interpreting Anthropological Aspects of the Everglades National Park" by J. C. Harrington.

The sponsors of the conference plan to arrange for the publication of the papers presented.[1] (*W. G. H.*)

MEETINGS OF THE SOCIETY

The Executive Committee has voted that the next annual meeting of the Society will be held at the University of Oklahoma, Norman, Oklahoma on the weekend of May 19–20. As is customary, it will be in conjunction with the annual meeting of the Central States Branch of the American Anthropological Association.

A special meeting for non-business purposes will be held in conjunction with the annual meeting of the American Anthropological Association at the Hotel New Yorker November 17–20, 1949. Further details may be obtained from Dr. James B. Griffin, Director, Museum of Anthropology, Museums Building, University of Michigan, Ann Arbor, Michigan. (*G.I.Q.*)

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[1] The report of the conference is now in press under the title *The Florida Indian and His Neighbors*. It is being edited by John W. Griffin and will be published this fall at Gainesville, Florida. *Editor*.

MEMOIRS

of the

SOCIETY FOR AMERICAN ARCHAEOLOGY

The following numbers, if in print, may be obtained from the Treasurer, Glenn A. Black:

Number 1. *Big Bead Mesa: An Archaeological Study of Navaho Acculturation, 1745–1812.* By DOROTHY LOUISE KEUR. vi + 90 pages, 4 plates, 5 figures. $1.00.

Number 2. *The Tchefuncte Culture, An Early Occupation of the Lower Mississippi Valley.* By JAMES A. FORD and GEORGE I. QUIMBY, JR., with an Appendix on the Skeletal Remains by CHARLES E. SNOW. xii + 113 pages, 12 plates, 23 figures, 3 folding tables. $1.50.

Number 3. *The Prehistory of Northern North America as Seen from the Yukon.* By FREDERICA DE LAGUNA. x + 360 pages, 30 plates, 33 figures. Out of print.

Number 4. *A Reappraisal of Peruvian Archaeology.* Assembled by WENDELL C. BENNETT. x + 128 pages, 72 figures. $2.00.

Number 5. *The George C. Davis Site, Cherokee County, Texas.* By H. PERRY NEWELL and ALEX D. KRIEGER, with an Appendix on the Corn by VOLNEY JONES. xvi + 255 pages, 66 figures, 20 tables. $3.50.

INFORMATION FOR AUTHORS

AMERICAN ANTIQUITY publishes original papers in the field of American archaeology, as well as comments, reviews, and discussions on matters pertaining to this field. Articles on other regions, or on such related subjects as geography, history, and ethnography, may be accepted if of special significance to American archaeology.

Accepted papers are published in the order of their receipt. Except for such papers as may be specially solicited, all papers bear the date of submission.

Manuscripts must be typewritten on standard 8½×11 inch paper, double spaced, and on one side of the page only. Bibliographies must follow a standard form. Citations from journals and series should be given as follows:

JENKS, ALBERT E., AND LLOYD A. WILFORD
1938. "The Sauk Valley Skeleton." *Bulletin of the Texas Archaeological and Paleontological Society*, Vol. 10, pp. 136–68, Abilene.

Citations from separate books or pamphlets:

JENKS, ALBERT E.
1936. *Pleistocene Man in Minnesota.* Minneapolis: University of Minnesota Press.

Illustrations over and above two pages of halftones or the equivalent in line cuts and tables must be paid for by the author or the author's sponsor. Photographs for reproduction should be on a glossy paper, unmounted, and of a proportion suitable for reduction to 5⅛×8⅜ inches or a portion thereof, making due allowance for captions. Line drawings should be in India ink on smooth, hardsurfaced paper, with figures written lightly in pencil on the margin or the back.

Galley proof, only, will be sent to authors, who will be charged for corrections costing more than 10 per cent of our bill for composition. Upon publication, manuscripts, illustrations, and engravings will be destroyed unless their return has been specifically requested.

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50	4.25	6.00	6.80	8.40	10.10	12.20	13.40	14.00
75	4.50	6.50	7.60	9.30	11.20	13.40	14.80	15.50
100	4.75	7.00	8.40	10.20	12.30	14.60	16.20	17.00
Additional 100's	1.00	2.00	3.20	3.60	4.40	4.80	5.60	6.00

Covers with title and date of issue of AMERICAN ANTIQUITY will be furnished at the following rates: 25 or less for $5.00; additional covers 2 cents each.

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